EDITORIAL

Progress Through Strife

WHEN the automotive history of 1925 is written, the historians probably will record it as the first big year in aviation progress in the United States. In 1924, the motor bus really got into action in a big way, but this year the growing general understanding of the possibilities and limitations of commercial and military aviation is the outstanding development.

Confusion reigns at the present moment. Investigating committees are compiling data, charges and counter charges are being made in Washington, race results are being analyzed and criticized, but commercial routes are being developed and flown successfully and the air mail continues to pile up records for reliability and consistency. The very chaos which rules in aviation thought today is a sign of definite progress, for doubt about existing conditions is a necessary prerequisite to change and improvement. New ideas are being propounded, old ones are being overthrown.

By the beginning of next year much of the smoke will have been cleared away. It is reasonable to expect that before the end of 1926 this country will be embarked on a constructive civil and military aviation program which will permit rapid development of this branch of transportation within the next few years. There is more reason for optimism than for pessimism on account of the current arguments which are taking place.

Spring Axles

FOR a number of years inventors have shown considerable interest in a type of chassis design in which axles are practically eliminated, their place being taken by the springs. The arrangement possesses certain more or less obvious advantages, but there are also a number of difficulties connected with it, and from the fact that cars of this type have not come into use to any extent it would appear that these difficulties have not as yet been entirely overcome.

As to the advantages, it is evident that the elimination of axles would result in a material saving in weight. In the conventional car the weight of the frame and everything on it is supported first by the springs, and the springs in turn are supported by the axles. Consequently, both the springs and the axles must be made strong enough to carry the whole load. If the springs served as axles as well, about one-half of this weight could be eliminated. What makes the proposition even more attractive is that the weight eliminated would be unsprung weight, and the remaining unsprung weight would be a comparatively small fraction of that found in the ordinary car, which should have a very beneficial effect on the riding qualities. In fact, practically all designers of cars of this type usually take particular pride in demonstrating their smooth riding qualities on rough roads.

One of the difficulties encountered in the design of this type of chassis is that there is a tendency for the wheel tread to change with the play of the springs, which may result in sideward slip of the tires on the ground. This difficulty should be materially lessened with balloon tires with their low inflation pressures, and with reduced wheel diameters.

It is also possible that the buying public would not take very kindly to this form of construction, which is rather a radical departure from the conventional. Somehow the absence of axles conveys the impression of an added hazard.

Spring steel is comparatively brittle and the prospect of having a spring snap and losing a wheel while going at considerable speed is somewhat disturbing.

Motor Prosperity in England

REPORTS of the unusual degree of prosperity of the British motor industry, which were sent to this country on the occasion of the Olympia show, draw attention to the fact that under certain circumstances at least the automobile industry may be prosperous even though industry in general is in the doldrums. Industrial conditions in general are far from satisfactory in Great Britain at the present time, as is evidenced by the fact that there are more than a million workers out of employment, and reports of a most pessimistic nature regarding a number of the major industries are appearing in the press. Shipbuilding, for instance, is at low ebb, owing to the dullness in the shipping trade the world over; British coal mine owners or colliery men are complaining that they are unable to compete with Continental firms.

If the British automobile industry is enjoying a boom, it is, therefore, not because the general financial status of the country has been raised to a higher plane, nor is it due to any decrease in foreign competition. It is true that the McKenna duties were re-applied in July last, but an analysis of prices asked for foreign cars exhibited at Olympia shows that most of the duty is being absorbed by either the makers of or the dealers in these cars. Probably the chief reason for the prosperity of the British industry under apparently adverse circumstances is that the British public has just begun to realize that the automobile is a most efficient aid in the conduct of business, and that for the business man who has to get about a good deal the purchase of a car is an investment and not an extravagance.

Our Industry Today

Slight Decline in Output, Already Forecast, is Now Apparent—Record Production for 1925 Seems Assured

PHILADELPHIA, Oct. 28—The West and Southwest are the weak sections so far as automotive sales are concerned, and used car conditions there are also well below par. In other parts of the country the market is in good condition, considering the season. Only a slight decline in production has been registered so far, and at most factories output is running ahead of sales. This situation is expected to continue for some time.

New companies are being added to the list of those that have concluded arrangements with financing companies to handle the instalment sales of new cars. These arrangements have the twofold purpose of bringing down financing and insurance costs to the purchaser and stabilizing the terms of down payments and the period for settling the unpaid balance. They are strengthening the automobile credit situation where support is most needed, and should help to silence the critics of the somewhat loose manner in which time sales have occasionally been handled.

New Record Production Seen

Publication of the September production figures, showing that 332,759 cars and trucks were turned out at the factories that month, has inspired the prediction that a new production record will be set this year. To better the mark of 4,094,601 set in 1923, about 300,000 cars a month will have to be turned out during the remainder of 1925, and from all signs this will be done.

Good business is being done by the parts and accessories firms, the original equipment manufacturers operating at a particularly high level for the season. Accessories business has shown an actual increase during the last two months, but replacement parts have fallen off, reflecting the end of the touring season.

Report that Dodge Buys Paige-Detroit

NEW YORK, Oct. 29—A report circulated by a financial news agency that a "large producer of fours" had acquired the Paige-Detroit Motor Car Co. and that announcement of the merger would be made November 1 is understood to refer to Dodge Bros., Inc., as the purchaser.

Considerable credence is given the rumor in usually well-informed financial and automotive circles, but confirmation by either of the principals involved is lacking. If true, the deal will give Dodge Bros. a line of sixes, which, presumably, would be sold through the Dodge dealer organization.

G. M. Third Quarter Earnings $28,161,730

Equals Second Quarter, Greatest in the History of the Company

NEW YORK, Oct. 27—General Motors Corp. third quarter earnings, after depreciation and all charges, were $28,161,730, equal, after preferred and debenture dividends to $5.09 per share on the common. This includes dividends of subsidiaries, but not equities earned by subsidiaries in excess of dividends paid. If the corporation's equities in undivided profits of the Fisher Body Corp., General Motors Acceptance Corp. and other subsidiaries were included, the amount earned on the common for the quarter would be $5.55 per share. The third quarter approximately equalled the second, which was largest in the company's history.

First Nine Months' Earnings

Net earnings, after depreciation and all charges, for the first nine months this year were $74,243,966. Current assets as of Sept. 30 were $277,136,233, against current liabilities of $79,865,530, leaving an excess of current assets of $197,270,703. This compares with $161,105,281 as of December 31, 1924, and $188,614,557 as of June 30, 1925.

President Alfred P. Sloan, Jr., said that all divisions are operating at capacity and unsold stock in dealers' hands is materially below the corresponding period last year, adding that General Motors was not planning any increase in plants' capacity of any great moment. "While it is contrary to our policy to make any forecast, as things look at this time, we expect to be able to maintain very satisfactory schedules during the Winter," he said.

An extraordinary feature of the third quarter income statement is that General Motors made greater profits per unit of output than in any other period of the year or of the two preceding years. Net profits include other items besides car sales, but if the figures are compared over various periods the ratio of gain is definitely shown. In the third quarter this year, during which most of the price cuts were in effect, profit per unit based on sales to dealers, was $127. The following table gives comparisons, the first four figures being for periods of 1925:

	Sales to Dealers	Net Profits	Profit per Unit
First quarter	155,315	$17,811,232	$115
Second quarter	233,894	28,271,000	121
Third quarter	222,199	28,161,730	127
Nine months	611,408	74,243,966	121
1924	587,341	45,330,887	77
1923	798,555	62,067,525	78

Operating economies are shown by the gain in unit profits, and, also, it is likely, lower costs of parts, especially bodies.

FORD ESTABLISHES PRODUCTION RECORD

DETROIT, Oct. 26—A new high daily production record for the automobile industry was established last week when the Ford Motor Co. branches in the United States turned out 8,466 cars and trucks, 331 better than the best previous day. The company aims before the end of the month to have a daily output of 8,500.

Output for the week of October 17 to 23 inclusive was 49,004 passenger cars and trucks, which is claimed as a six-day record production for the industry. Should this rate be kept up the company will equal its estimated output of 200,000 for the present month.

Nash Enlarges Plant to Meet Car Demand

KENOSHA, WIS., Oct. 28—Because of the increase in demand for Nash cars, five new buildings are being added to the local plant of the Nash Motors Co. to augment production. The additions, with a total floor area of 94,428 square feet, will be ready for occupancy early in November.

According to Charles W. Nash, president of the company, these additional manufacturing facilities, together with the new Nash force, which has been enlarged 50 per cent, will enable the company to increase daily production by at least 100 more automobiles.

In explaining the expenditure of $1,500,000 for machinery and equipment, President Nash said that, for thirteen consecutive months, Nash sales have shown an average monthly increase of more than 82 per cent over the corresponding months of previous years.

S.A.E. Announces Meeting Dates

Sectional Gatherings to Take Place in Many Cities—Annual Dinner

NEW YORK, Oct. 27—The Society of Automotive Engineers has issued a bulletin, calling attention to the coming meetings of the various sections of the society. In addition to meetings already announced in AUTOMOTIVE INDUSTRIES, the following appear:

Nov. 4—Milwaukee. Milwaukee Section, Society of Automotive Engineers. Subject, "Engine Lubrication." Blatz Hotel.

5—Detroit. Detroit Section, Society of Automotive Engineers. Subject, "Automobile Headlighting." General Motors Building.

6—Los Angeles, Southern California Section, Society of Automotive Engineers. Subject, "Road Construction and Destruction." City Club.

12—Indianapolis. Indiana Section, Society of Automotive Engineers. Subject, "Commercial Aviation." Hotel Severin.

17—Buffalo. Buffalo Section, Society of Automotive Engineers. Subject, "Commercial Aviation." Statler Hotel, 8 p. m. Dinner, 6:30 p. m.

19—Cleveland. Cleveland Section, Society of Automotive Engineers.

20—Washington, D. C. Washington, Section, Society of Automotive Engineers. Subject, "Ordnance Automotive Equipment." Cosmos Club.

20—Chicago. Chicago Section, Society of Automotive Engineers, Speaker, C. F. Kettering.

24—San Francisco. Northern California Section, Society of Automotive Engineers. Subject, "Mechanical Traffic Control." Engineers' Club.

Dec. 10—Indianapolis. Indiana Section, Society of Automotive Engineers. Subject, "High Duty Engineers."

Jan. 14—New York City. Society of Automotive Engineers. Annual Dinner. Hotel Astor.

26-29—Detroit. Society of Automotive Engineers, Annual Meeting.

Packard Co. Report Shows Progress

DETROIT, Oct. 27—In the fiscal year ended August 31, the Packard Motor Car Co. attained the greatest sales, production and earnings in its history, according to the annual report made public today.

Sales of cars, parts, marine and aviation engines totaled $60,475,989.89, which was $14,472,310.63 greater than last year. Production reached 24,246 passenger cars. Sales abroad were 50 per cent greater than those a year ago. Net earnings were $12,191,081.21, after Federal income tax. Last year, the net earnings were $4,805,174.54, after Federal income tax. The current assets as of Aug. 3 aggregate $29,281,414.82 and were three and one-half times current liabilities.

These ratios were much higher last year, but the difference is due to the disbursement of the large amounts of cash necessary to retire the preferred stock, to the increase in accounts payable, and to the decrease in working inventory. During the year just ended, the company, according to the report, bought freely of the outstanding preferred stock and retired the balance at the end of the year at $110 and interest. The total amount needed for this disbursement was $12,780,446.69.

Booth Reported as Developing New Car

INDIANAPOLIS, Oct. 27 — Development of a new automobile here by James Scripps Booth, of Detroit, was reported recently when the State motor vehicle license department refused to license the experimental car upon which Mr. Booth has been working for time in the machine shop of Chevrolet Bros. The cause for the refusal was the lack of engine and body serial numbers and other identification marks, which are essential requirement. The head of the license bureau is reported to have advised Mr. Booth to obtain a certificate of sale and identification numbers and marks from Louis Chevrolet, who is supposed to have done the development work. No details could be obtained from Mr. Booth or from Louis Chevrolet.

Opinions Sought on Show "Solicitation"

NEW YORK, Oct. 28—The National Automobile Chamber of Commerce show department has sent a questionnaire to all exhibitors at the annual show to be held in New York City to determine the concensus of opinion on the proposal that exhibitors refrain from soliciting orders during the show. Sufficient replies have not been received to indicate the trend of opinion, but the Automobile Merchants Association of New York, Inc., at a luncheon meeting Wednesday, voted against the proposal

New Wills Ste. Claire

MARYSVILLE, MICH., Oct. 26—A new Gray Goose Traveler model has been added to the Wills Sainte Claire six-cylinder line. The new job is a sport touring car with Burbank top over natural wood bows, and hand crushed Spanish leather upholstery. The accessory equipment on this model is unusually complete, including front and rear bumpers, extra tire, wheel and carrier.

Coleman Truck — Correction

In an item in our Oct. 15 issue it was stated that the Coleman four-wheel drive truck was equipped with a Wise axle. This should have been a Wisconsin axle, as axles are being furnished the Coleman Motors Corp. by the Wisconsin Parts Co.

Business in Brief

Written exclusively for AUTOMOTIVE INDUSTRIES *by the Guaranty Trust Co., second largest bank in America.*

NEW YORK, Oct. 28—Trade and industry continued to expand last week. Certain basic industries, including coal, iron and steel, and textiles, reported higher activity and larger orders.

WORLD WHEAT CROP ESTIMATE

The latest estimate of the world's wheat crop, published at Rome, forecasts a harvest of 3,505,000,000 bushels, which is 16½ per cent larger than last year's crop and 4½ per cent above the five year pre-war average.

CAR LOADINGS

Car loadings in the week ended October 10 were 1,106,099 cars, comparing with 1,112,463 in the preceding week and 1,088,462 in the corresponding period last year.

BUSINESS FAILURES

Business failures reported to Bradstreet's for the week ended October 22 numbered 327, as against 306 in the preceding week and 347 in the corresponding period last year.

BANK DEBITS

Bank debits to individual accounts reported to the Federal Reserve Board for the week ended October 21 were 24 per cent larger than the total for the preceding week (a holiday week) and 22 per cent above that of a year ago.

PRICE INDICES

Fisher's index of wholesale commodity prices stood at 156.1 last week as compared with 156.5 in the preceding week, 156.1 two weeks earlier and 158.3 four weeks earlier. The wholesale price index of the Department of Labor last month was 159.7, as against 160.4 in August and 148.8 in September last year. The retail food price index stood at 159.0, comparing with 160.4 in the preceding month and 146.8 a year ago.

FEDERAL RESERVE BANK

Bills and securities held by the Federal Reserve banks declined $46,100,000 during the week ended October 21, with decreases of $40,600,000 in discounts and $12,400,000 in Government securities, and a gain of $6,200,000 in open market purchases. Note circulation declined $20,600,000 and deposits $4,200,000, while reserves increased $19,500,000. The reserve ratio rose from 71.1 to 72.6 per cent.

MONEY

Call money was slightly easier last week, ranging from 4 to 5 per cent, as compared with 4½ to 5½ per cent in the preceding week. Time loan and commercial paper rates were virtually unchanged at 4¾ to 5 per cent and 4½ to 4¾ per cent, respectively.

Automobile Sheet Orders Extra Heavy

Immediate and Future Demands Large—Automotive Buying of Pig Iron Small

PITTSBURGH, Oct. 27—Automobile sheet producers in this district in the last week have been getting an extra heavy volume of business. While a large part of it was placed in anticipation of the $3 advance to 4.40 cents that was made last week, the new price has been received favorably, and at least one large sale was made at the advanced figure. A parts manufacturer placed an order for 4,000 tons with one maker at 4.40 cents for delivery over the balance of this year.

The leading producer has not yet opened its books for the first quarter, and there are intimations in some quarters that the price might be advanced further at that time.

Automotive interests ordered heavily for both immediate consumption and stocking purposes. The leading producer is now practically filled up on automobile tonnage for the balance of the year, and the independents cannot make deliveries on any more automobile sheet tonnage for six weeks.

Sidelights on the Situation

The volume of business from the automotive interests was so heavy, in some instances, that district sales' offices in the automobile centers have not been able to write up all the orders in a week and a half. A large order for blue annealed for underframes is also noted here.

Producers joyously proclaim that, following the rather soft condition of prices during the Summer, the market has now turned so firm that consumers must surely know that prices will not go down. Industrial, especially automotive, consumers counter by declaring that the selling prices of their products and all their commitments are based on the heretofore prevailing market for steel, and that, if market developments make it more and more uncertain as to whether or not they will be able to cover their requirements at prevailing prices, consumption and tonnage on steel mills' order books will suffer.

It is thought in some quarters that international and stock market developments have engendered in high places in the steel industry a bullish sentiment that exceeds in enthusiasm even that which was in evidence during the post-Armistice boom. While automotive consumers have conceded an advance of $3 per ton in the price of full-finished automobile sheets by way of readjustment, they are in no mood to consider with equanimity a general rise in the steel market's price structure. Some metal consumers are wedded to a tradition, fallacious though it is, that when raw metals are high in price, they make more money on their finished products. Automotive consumers are not in that class. To them higher steel prices mean either losses or the necessity of advancing their own selling prices.

Pig Iron Market Quiet

Pig Iron—Narrow as the pig iron market rules, the influence of the coke situation tips the scales in sellers' favor. Automotive foundries are buying in single car lots, when they buy at all, but blast furnace interests are seemingly biding their time, hoping that better steel market conditions will enable them to bring about higher pig iron levels.

Copper—Europe is fighting tooth and nail to hold the price of copper down. Domestic demand is fair.

Tin—Tin has joined rubber as one of the commodities by the high price of which England is paying her war debt to the United States. Americans, however, continue to be the most active buyers.

Lead—A deficit in the world supply continues to act as prop for this market.

Zinc—High prices and good demand from galvanizers continue.

INGOT ALUMINUM PRICE INCREASED

PITTSBURGH, Oct. 26—The Aluminum Co. of America has increased the price on ingot aluminum one cent a pound, but made no change in the price of sheets. The new prices make 99 per cent 29 cents per pound, 98-99 per cent 28 cent a pound, and No. 12 Alloy 27.50 cents per pound. These prices are for 50-ton lots, while for smaller lots the prices range up to 0.20 cents higher for one ton of ingot. The ingot prices are now the highest since December, 1920, when 99 per cent was 32 cents.

Dodge Time Sales' Plan for Cleveland

CLEVELAND, Oct. 27—A special plan for handling retail time sales of Dodge automobiles, one designed expressly to meet local conditions, soon may go into effect here.

This came to light today through an announcement by W. Pitt Barnes, general manager of the Cleveland Dodge offices.

Differing slightly from a general time sales program, recently adopted by the Dodge Co., the local plan, in brief, is this:

For cars bought and paid for within eight months 3 per cent interest is charged. For cars bought and paid for within thirty days the interest charge of 3 per cent is refunded. For cars bought and paid for within ten months the interest charge is 4 per cent, and if twelve months are required for full payment the interest charge is boosted to 5 per cent. Insurance rates are at local par, or $1.48 for $100.

U. S. Army Curtiss Wins Schneider Race

Lieut. Doolittle Secures Another Leg on Trophy Cup—Britisher Second

BALTIMORE, Oct. 26—Breaking all previous speed records for seaplanes, Lieut. James A. Doolittle, flying the U. S. Army Curtiss racer, won the Schneider Cup Race here today, averaging 232.573 miles per hour for the entire course of 350 kilometers (217 miles). The race consisted of seven laps around a triangular course of 50 kilometers (31.1 miles) and was flown in a strong Southeast wind.

Second place was won by a British entry, a Gloster seaplane with a special racing Napier engine, flown by Capt. Hubert Broad, winner of the Schneider Cup Race in 1922. His average speed for the entire course was 199.169 miles per hour. Third place went to Lieut. de Briganti, flying a Macchi flying-boat powered with a Curtiss D-12 engine. His time for the course gave him an average speed of 168.444 miles per hour.

Two Navy Entries Forced Down

The two Navy Curtiss entries did not complete the race. Lieut. Ralph Cuddihy, piloting one ship, was forced down on the last leg of his last lap by engine trouble. Lieut. Ralph Ofstie, piloting the other, was forced down on the second leg of his fourth lap. At the time when they were forced down, Lieuts. Cuddihy and Ofstie were in second and third places, respectively.

The British "Mystery Ship," a Supermarine-Napier monoplane, was wrecked during the endurance tests on October 23 and could not participate. A second Gloster-Napier seaplane, which was entered to take the place of the wrecked Supermarine-Napier was also disabled while going through some routine tests on the morning of the race.

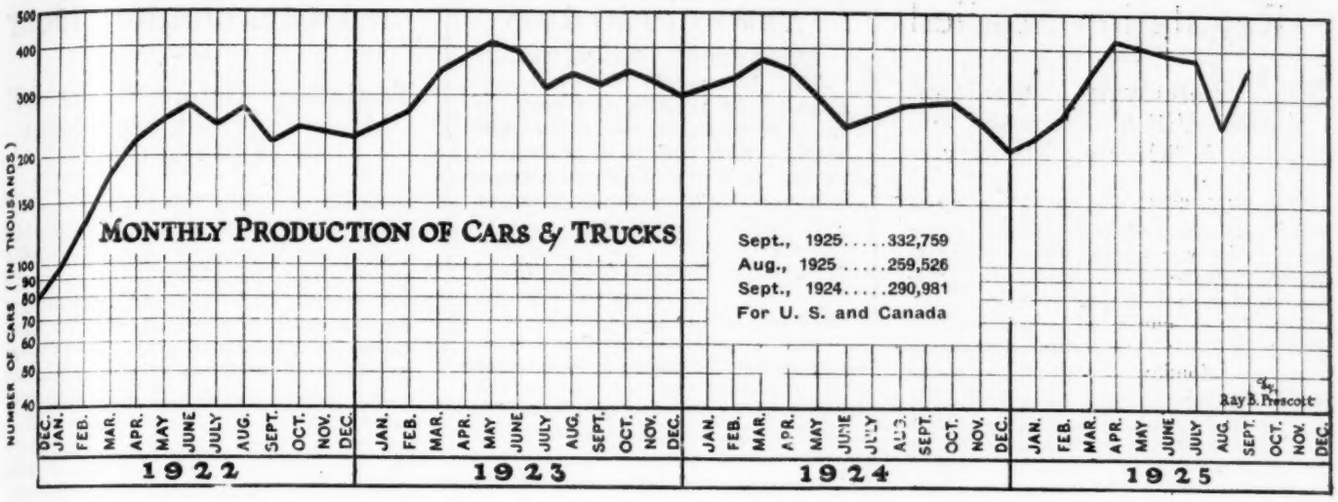
A second Macchi flying-boat developed carbureter trouble just before the race, and it was found impossible to correct the defect in time for the race.

America now has two legs on the Schneider Cup, and, if it wins the race again next year, the cup will become the permanent possession of the National Aeronautical Association.

Olds Installs Machine Resulting in Saving

LANSING, Oct. 28—The Olds Motor Works has stepped out of the routine in its cleaning operations, installing a machine which puts it in the laundry class. The new machine washes, rinses and sterilizes 800 pounds of oil-soaked rags each day. In the past these rags were destroyed, after they had been used once. This enables them to be re-used until they are worn out. The economy, while small, is one of the many that the local factory has undertaken.

September Production Gains Heavily Over August



Many Parts Makers Give Free Samples

M. & A. M. A. Survey Shows 60% Make No Charge to Vehicle Makers

NEW YORK, Oct. 28—In a survey just completed by Neal G. Adair, manager, Educational Department, M. & A. M. A., it was found out that the majority of parts and accessory manufacturers producing original equipment for cars and trucks furnish free samples to vehicle makers for test purposes. Low cost samples and those taken out of regular stock are furnished without charge, and, in many cases, even specially made samples are not billed against the vehicle manufacturer.

Forty Take Part in Survey

Forty members of the M. & A. M. A. took part in the survey, which included makers of axles, springs, bumpers, carburetors, drive chains, clutches, gears, lamps, pistons and rings, radiators, shock absorbers, castings, stampings, locks, electrical equipment, steering gears, body hardware and various lines of accessories. The prevailing practices of these in supplying samples were divided as follows:

No charge, 36 per cent.

No charge to customers and likely prospects in large volume production, 12 per cent.

Samples billed on memorandum, with privilege of returning without charge, 12 per cent.

Samples specially made, billed at material and labor cost and rebated at regular production cost (if order is obtained), 27 per cent.

Flexible policy, with charge or no charge, according to individual cases, 13 per cent.

It will be noted that the first three divisions, aggregating 60 per cent of the members in the survey, make virtually no charge for test parts.

Attention is called to the fact that the parts maker, trying to induce the adoption of his product, must expect to stand the cost of proving the worth of the product, and, under present competitive conditions, he can not expect compensation for samples taken out of his regular stock, nor where the cost of specially made samples is small. However, when the expense of making the special samples is great, the parts maker can induce the vehicle maker to help bear the expenses. It is suggested, in conclusion, that parts makers would do well to keep cost accounts of sample production, charging it to sales promotion.

PRICES OF NEW STAR MODELS ANNOUNCED

NEW YORK, Oct. 29—Prices on the new Star six model are as follows:

Coupster	$745
Coupe	820
Coach	880

Durant Denies Rumor Regarding G.M.

NEW YORK, Oct. 27—W. C. Durant issued a statement today denying the rumor that he had been seeking to regain control of General Motors. The statement bears out the dispatch published in AUTOMOTIVE INDUSTRIES last week, showing the improbability of the rumor. He said: "Because of the widespread publicity given the rumor, I wish emphatically to deny that I am planning or seeking control of General Motors and have no desire or intention of again becoming active in its affairs, were such a thing possible. My interest in General Motors is purely that of an investor, and my holdings have been recently increased because of the confidence I have in the future of that great corporation and of its commanding position in the industry."

Automotive Tax Collections Mount

Treasury Department Announces September and Year-to-Date Figures

WASHINGTON, Oct. 28—International revenue collections from the automotive industry in September, 1925, were $4,220,828.32 greater than those for September, 1924, while those for the period from July 1, 1925 to September 30, 1925, were $11,521,126.83 more than for the corresponding period last year, the Bureau of Internal Revenue, Treasury Department, announces here.

Total collections from the automotive industry for September last are given at $15,932,884.16 as compared with $11,712,055.84 for September, 1924, while total collections for the period July 1, 1925, to September 30, 1925, are given at $43,983,788.63, compared with $32,462,661.80 for the corresponding period last year.

Itemized Statement

Itemized, the collections give automobile trucks and automobile wagons, $1,463,394.85 for September, 1925, as compared with $545,096.98 for September, 1924; other automobiles and motorcycles, $11,800,416.81 for September, 1925, as compared with $9,278,014.24 for September, 1924; and automobile parts and accessories, $2,669,072.50 for September, 1925, as compared with $1,882,944.62 for September, 1924.

Road Builders' Convention

NEW YORK, Oct. 27—More than 200 exhibitors have already applied for space at the road show to be held at the Coliseum by the American Road Builders' Association in conjunction with its convention in Chicago Jan. 11-15. They will display the latest products in road machinery, equipment and materials.

Interstate Motor Regulation Studied

Bill, Embodying Operators' Views, Will be Discussed at A. A. A. Meeting Monday

WASHINGTON. Oct. 29—Drafting of a bill for the regulation of interstate motor vehicle carriers, which embodies the bus operators' viewpoint, will be discussed at a meeting to be held in the offices of the commercial vehicle division of the American Automobile Association here next Monday. It has been decided by the operators, it is announced, that a meeting on this date with a definite result accomplished, would allow time for the necessary inter-association conferences necessary before Congress meets on December 7.

The present plan is to use the bill of the Association of Railroad and Utilities Commissioners as a skeleton and incorporate what changes the operators consider necessary.

Overland Output Increases

DETROIT, Oct. 28 — Shipments of Willys-Overland products for the year to October 20 totaled 174,844, as compared with 130,971 in the corresponding period of 1924. It is announced that the company has forwarded orders for 15,000 cars for November delivery. Officials of the company declared that between 17,000 and 18,000 will probably be produced and shipped, which will compare with 5,000 for November, 1924.

Cabled advices from the Olympia Show in London state that orders for $250,000 Willys-Overland products were received in the course of the show.

LOCOMOBILE ADDS NEW COUPE TO LINE

BRIDGEPORT, CONN., Oct. 26 —The Locomobile Co. has announced the addition of a coupe to the Junior Eight line. The new model, which will be in production in the latter part of November, will have an extra wide, straight seat inside and a rumble seat in the rear deck for two passengers. It will be finished in gray and black and will follow closely the lines of the Junior Eight roadster.

Dividends Declared

DETROIT, Oct. 24—The Board of Directors of the C. G. Spring and Bumper Co., at their recent meeting, voted the regular dividend on common stock of 10 cents quarterly, payable Nov. 15 to stockholders of record Nov. 8.

In addition to the regular dividend, extra dividend of 5 cents was declared, payable Nov. 15 to stockholders of record Nov. 8. This makes a total dividend of 15 cents for the quarter.

Motor Vehicle Tax Costs Dealers Dear

Testimony Before Ways and Means Committee Estimates it at $40,000,000

WASHINGTON, Oct. 26—Automobile dealers are losing a total of $6,000,000 a year through the operation of the motor vehicle tax, C. E. Gambill, president of the National Automobile Dealers Association, told members of the House Ways and Means Committee at the tax hearing today. This sum represents tax losses on demonstration and call cars and loss of interest on taxes paid by the dealers to the manufacturers and not collected from the consumer for 30 days or more.

Dealers Collect for U. S.

Mr. Gambill further estimated that dealers, on the average, always have invested $20,000 in excise taxes, and that, during the eight years of operation of the tax, dealers have collected nearly $900,000,000 for the Government at a cost to them of about $40,000,000.

Besides Mr. Gambill, the association was represented by J. H. McAlman, of Boston; J. W. Tarbill and F. E. Santry, of Cincinnati; C. E. Fisher and Claude Holgate, of Newark; C. W. Hunt, of Cleveland; Sidney Bowman, of New York, all dealers, and C. A. Vane, general manager, and W. B. Guy, general counsel.

Developments of the Week in Leading Motor Stocks

NEW YORK, Oct. 28—The sharp advances and great activity in the stocks of the motor companies has but served to whet the appetite of the speculative public. A considerable number of these stocks have sold at new high levels during the week and despite a tremendous volume of profit-taking sales, these offerings have been absorbed, and excited bidding has carried prices even higher. In some cases it is unquestionably true that these stocks are not overvalued even at the prevailing level, but in others it would seem that only the enthusiasm of the speculator, buoyed up by recurrent rumors of consolidations and "melons" could explain the buying. There has been nothing in the trade news of the week nor has there been any unexpectedly favorable development in the fundamentals of finance or industry to account for such advances as have been registered. It is the old story of the speculative public having taken the bit in its teeth.

A coup against the short interest in Chandler Motors featured the closing session of the week. It may be that the publicity attracted to this company's product through a car guided by wireless, on exhibition in Boston, suggested inaugurating the movement in the stock from that center. In any event, New York was in ignorance of the contemplated advance until buying orders came pouring in from the Hub and with the delay in the ticker it was too late for brokers here to act. An advance of fourteen points in as many minutes was recorded, of which ten points was lost in the next few days. There was, of course, no news to explain the movement.

This episode, unimportant in itself, is merely indicative of much of the present manipulation. It served still further to alarm the short interest elsewhere, particularly in Jordan. It was reported that the market management of this stock had been changed and there were predictions that a price of 90 would be registered in it at the expense of the short interest. Buying from this source resulted in an advance of 10 points or more in the price. Dodge Brothers was said to be bound for 50, the basis here being a reported consolidation with Packard. In connection with the strength in the latter stock, there were reports that an extra dividend was about to be declared. In Studebaker, estimates of earnings of $9 per share for the nine months revived reports of an increase in the dividend rate to be made by directors this week. Moon Motors reached a new high level on official estimates of $8 per share earnings this year and the probability of an extra dividend.

Through all of the discussion of reduced production and lower prices, there ran the note of an increasing export demand and rosy predictions of sales to be made in foreign lands in 1926.

An announcement of the week which aroused considerable interest was that the General Motors Corp. will finance Vauxhall Motors, Ltd., of London. General Motors plan for developing its foreign connections are known to encompass not only Great Britain but other countries, and this was taken as the first step in the fulfillment of these plans.

In the accessory field, there was interest shown in the announcement that the stock of the Splitdorf-Bethlehem Electrical Co. would be listed on the New York curb. This is one of the enterprises in which Charles M. Schwab is largely interested. The plan of reorganization of the Miller Rubber Co. has been approved, providing for the issuance of five shares of new no par common stock for each share of the old $100 par value stock. The $4,000,000 of unissued 8 per cent cumulative preferred stock has been sold at $103.50. United States Rubber, Fisk Tire and other stocks of this group were strong and active in sympathy with the motor stocks, but showed no independent strength.—H. H. S.

Pledge Instant Price Reduction

Automobile Manufacturers Agree to Make Cuts if Excise Tax is Lifted

WASHINGTON, Oct. 29 — Signed statements of America's foremost automobile manufacturers pledging themselves to reduce instantly the price of automobiles by the amount of the war excise tax eliminated were this week submitted to the House Ways and Means Committee by George M. Graham on behalf of the National Automobile Chamber of Commerce. Mr. Graham, who is acting chairman of the tax committee of the N. A. C. C., was the first of twelve representatives of the automotive industry to be heard by the committee.

The character of testimony given by Chairman Graham and the other automotive representatives, it is reported, created a favorable impression and in all likelihood will win at least a reduction of the war excise levies on passenger cars.

Mr. Graham characterized the Federal war excise levies on motor vehicles as a surtax on moderate incomes and small business, calling attention to the fact that 75 per cent of all cars retail for less than $800.

Mellon's Point Denied

The point made by Secretary of the Treasury Mellon, namely, that Federal aid to roads justifies continuation of an excise tax on automobiles was declared by Oscar Brown, representing the American Automobile Association, to be wholly untenable and contrary to the intent of Congress in enacting the Federal Aid Act as a measure for the general good, and the excise tax to meet the emergency. Spokesmen for the other automotive groups appearing before the committee fully concurred in this view.

Speaking for the dealers, C. E. Gambill, president of the National Automobile Dealers' Association, called the committee's attention to a recent announcement of Henry Ford that, if he could reduce the price of his car by $25, there would be a million new prospective purchasers on the market. The war tax, Gambill added, averages $30 a car.

Prominent Automotive Men Testify

W. W. Cloud, of Baltimore, president of the National Association of Taxicab Owners, urged the repeal of the $10 occupation tax on taxicabs, the 5 per cent sales tax and the 2½ per cent tax on automobile parts.

Others who appeared before the committee in behalf of the automotive industry were E. P. Chalfant, vice-president, Gill Mfg. Co., of Chicago, representing the Motor and Accessory Manufacturers' Association; David Widman, representing the Automobile Body Builders' Association; F. C. Van Cleef, chairman of the tax committee of the Rubber Association of America; D. H. Kelly, president of the National Battery Manufacturers' Association; S. Duncan Black, representing the Automotive Equipment Association of Chicago; and Congressman Grant M. Hudson, of Michigan.

STUDEBAKER ADDS THREE NEW MODELS

SOUTH BEND, IND., Oct. 26— Studebaker is now in production on a 120 in. wheelbase Big Six chassis model which is offered in three five-passenger body styles: a sport phaeton listing at $1,575; a club coupe at $1,750 and a sedan at $1,995. In addition, all Studebaker models are now fitted with oil filters and air cleaners as regular equipment.

The new 120 in. Big Six is exactly the same as the 127 in. wheelbase model, which is continued without change, except that it has 32 x 7.30 in. tires and a rear axle reduction ratio of 4 8/13 to 1.

Bodies on the short wheelbase Big Six are all finished in lacquer with the closed model upholstered in fabric and the open in leather. All three body models have artillery wheels, shock absorbers, automatic windshield wipers, sun visors, cowl ventilators, rear view mirrors, rear traffic signals, dash gasoline gages, cowl lamps, clocks, and locks on ignition, steering gear and spare tire. In addition, the closed models have smoking sets and door locks, and the club coupe has a trunk rack.

A five-passenger sedan model listing at $1,395 has been added to the Standard Six line and the berline body type on this chassis has been discontinued.

Oakland Produces New Style Landau

PONTIAC, MICH., Oct. 27—The Oakland Motor Car Co. now has in production a new style landau sedan with larger body, wider rear seat, larger rear quarter windows, new colors and other refinements. The price remains unchanged at $1,295.

The body is longer and the rear quarter has been changed from oval to square finish with upper rear corners rounded to conform to the rear line of the body. The lower body is now finished in pyramid gray with black upper structure and red striping on body, hood, louvres and wheels.

Accessory equipment furnished on this model includes automatic windshield wiper, sun visor, front snubbers, natural wood wheels, front bumper, rear fender guards, dash gasoline gage, heater, motometer, VV windshield and roller shades.

Current sales of the landau sedan are said to be greater than of any other body type with exception of the coach.

Commissioners Study Car Insurance Plan

New York, Ohio and Massachusetts Officials to Work Out Method for Joint Action

NEW YORK, Oct. 27—Proposals for revision of the Chrysler-Palmetto automobile fire and theft insurance plan will probably be ready for submission to James A. Beha, State superintendent of insurance, before the conference of State commissioners, which he has called for Thursday morning. It is understood that the revision will meet Superintendent Beha's requirements without materially altering the principal points in the original plan.

Commissioners Conn, of Ohio, and Monk, of Massachusetts, will confer with Beha, with the Chrysler plan one of the chief topics for discussion, and it is said that they will announce a plan for joint action with reference to this plan. Commissioner Conn's move to revoke Palmetto's license in Ohio was supported by Federal Judge Donahue's opinion last week, denying the petition for an interlocutory decree restraining Conn from moving against the Chrysler plan.

B. E. Hutchinson, vice-president of Chrysler Corp., is in Detroit this week, but at the offices of Cabell, Ignatius & Lown, attorneys for the insurance litigants, it was said that the revisions would probably be submitted to Beha before Thursday and would be made public at Beha's discretion.

Rueshaw, Prominent Executive, Resigns

LANSING, Mich., Oct. 28—R. C. Rueshaw, sales manager for the Reo Motor Car Co., has resigned his position, though retaining his seat on the board of directors, it was announced today by R. H. Scott, president and general manager. He is succeeded by C. A. Triphagen, assistant sales manager for the past three years. Illness was given as the cause of his resignation. Early last winter, Mr. Rueshaw contracted double pneumonia. From this illness he has never fully recovered. He has been with the company since its inception in 1904, and has seen it grow to the prominence it now has in the automotive field.

Denounces Instalment Sale of Automobiles

ATLANTIC CITY, N. J., Oct. 24—T. James Fornley, of Philadelphia, executive secretary of the National Hardware Association, told the closing session of the Association convention here yesterday that the instalment plan of selling automobiles had started the country toward economic and financial ruin. The convention adopted unanimously a resolution condemning the instalment method.

Use of Buses by Railroads Gains

Survey by N. A. C. C. Shows That Traction Lines Also Realize Their Growing Value

NEW YORK, Oct. 28—Increasing use of motor vehicles by railroads and traction lines is shown by the fact that 51 steam railroads are now using motor trucks for freight hauling, against 33 a year ago, and that the Philadelphia Rapid Transit Co. is expected shortly to add taxicabs to its truck and motor bus transportation. Negotiations are pending between the Philadelphia Rapid Transit Co. and the Yellow Taxi Corp. of New York, for acquisition by the Philadelphia Rapid Transit Co. of the New York company's stock in the Yellow Taxi Co. of Philadelphia. If the deal, which is said to involve some $3,000,000, is completed, both taxicabs and motor buses would serve as important feeders of the Philadelphia Rapid Transit.

The motor truck department of N. A. C. C., through a survey, learns that 15 railroads are considering the introduction or extension of motor truck service; that 20 railroads now use more than 219 motor buses; that 18 not using buses, are considering an auxiliary bus service; that 190 steam and electric lines are using more than 496 rail motor coaches; and that 18 other roads are investigating the use of such coaches. Thirty railroads have contracts with terminal companies in Cincinnati or St. Louis for motor truck interchange of less than a carload of freight; 8 use trucks to replace trains carrying package freight, and 10 give store door delivery by truck. Ten have established motor truck routes parallel to rail lines; 5 have substituted buses for branch lines, and 2 are using buses as feeders through territory not previously served by rail.

Sees Export Market as Stabilizing Factor

CLEVELAND, Oct. 28—The export market is going to be the most stabilizing factor in the automotive industry, in the opinion of Edward S. Jordan, president of the Jordan Motor Car Co., Inc., here, who sets forth five specific reasons for this belief. They are:

"While there are nearly 20,000,000 automobiles in use in America, there are only about 4,000,000 in all the world besides.

"In British East Africa, where Roosevelt traveled with a safari fifteen years ago, a motorist just recently covered the same distance of 850 miles in thirty-six hours.

"The advent of the small, light car, now dominant in American production, will make the American product dominant in the European market.

"The determination of the plan upon which the obligations of European governments will be settled will open up a world-wide business movement.

"The saturation point in the business of transportation will never be reached until every civilized being on the face of the earth has some means of transportation and none ever wears out."

Rubber Companies' Outlook Excellent

AKRON, Oct. 28—While tire production is now running between 75 and 80 per cent of capacity, an encouraging aspect of the present situation is that stocks in the hands of both manufacturers and dealers are below normal, in most cases. Although some dealers have purchased more than their current requirements, as a result of the advancing tire prices, the repeated warnings of tire manufacturers not to overstock have been effective in checking this trend.

Building construction in the rubber industry this year will amount to something like $6,000,000. In the Akron district, alone, the rubber companies are spending nearly $5,000,000 on plant additions and other improvements.

Studebaker Sales Show Large Increase

DETROIT, Oct. 28—The sales of the Studebaker Corp. for the first nine months of this year amounted to 111,525 cars, as compared with 76,508 in the corresponding period. Sales for the period exceeded the total of any previous year, except 1923. Sales in 1924 were 110,240 cars and 145,167 in 1923.

Earnings for the third quarter are estimated at more than double the $2,131,409 reported for the third quarter of 1924. On this basis the company is expected to show earnings for the first nine months of this year approximating $15,000,000, with a balance for the common shares equal to nearly double the $4 annual dividend. No increase in the dividend rate is anticipated, although an extra payment may be made. Preferred stock outstanding amounts to about 85,000 shares.

T. A. Coleman Dies

MADISON, WIS., Oct. 26—T. A. Coleman, president of the Madison Kipp Co., manufacturers of oil cups, and vice-president of the International Harvester Co., died at a local hospital on Oct. 19 following a short illness. Mr. Coleman was born in Oshkosh in 1858 and came to Madison in 1895 as manager of the McCormick Harvester Co. which was later consolidated with I. H. C., whereupon he was made manager of the consolidated branch. In 1905 he became manager of the Madison Kipp Co. and was later transferred to the Chicago office of the International as northwestern sales manager. He resigned in 1919 and came to Madison, and was elected vice-president of International.

FINANCIAL NOTES

Mohawk Rubber Co.—Sales for the first eight months of this year were $3,425,133, against total sales of $3,413,731 for all of 1924, according to a statement just issued. Net profits were $365,701.99, compared with earnings of $343,656 for 1924.

The consolidated balance sheet shows total assets of $3,486,170.22, including property accounts at $1,360,120.77; inventory and current assets, $2,074,195.36; trustees' stock, $6,639.89; prepaid insurance etc., $45,224.

Liabilities are listed as follows: capital stock, $1,963,443.30; common, no par, $20,000; current liabilities, $898,829.53; reserves, $162,221.12; capital surplus, $18,902; total, $3,486,170.22.

Mohawk common and preferred stocks are now listed on the Cleveland stock exchange.

Ford Motor Co. of Canada, Ltd.—For the year ended July 31, this company shows net profit $6,132,327, after charges and taxes, equivalent to $87.60 per share earned on $7,000,000 outstanding capital stock, against $3,719,187, or $53.13 per share in the preceding year. Profit and loss surplus was $24,001,213, against $19,609,861; and sales $40,488,812, against $43,459,138. Output was 70,816 cars and 4,543 tractors, compared with 79,807 cars and 3,785 tractors the preceding year.

Willys-Overland Co.—J. N. Willys, president, estimates Willys-Overland third quarter earnings at between $3,500,000 and $4,000,000 before interest, taxes and all deductions. This would equal $1.22 a share on the common, after preferred dividends and estimated Federal taxes, with earnings for the first nine months of the year estimated at $5 per share.

Electric Storage Battery Co.—Business for the first eight months of 1925 is ahead of the same period last year, with indications that the year's earnings will exceed the $8 per share, after taxes, earned last year. An extra $1 above the $4 regular dividend was paid in 1924 and 1923 with the outlook for at least as large dividends for 1925.

Houde Engineering Corp.—This Buffalo, N. Y., corporation reports a 45 per cent increase in production of Scully spring protectors for the last three months over the corresponding months of 1924 with exceptionally large export business to Europe and South America.

Mullins Body Corp.—This corporation has declared regular quarterly dividend of 1¾ per cent on preferred, payable Nov. 1, to stock recorded Oct. 17.

Moon Motor Car Co.—This company has declared regular quarterly dividend of 75 cents per share payable Nov. 1, to stock of record Oct. 15.

Kelsey Wheel Co.—This company has announced $1.75 quarterly dividend on preferred, payable Nov. 1 to stock of record Oct. 20.

Fisher Body Corp.—This corporation has declared quarterly dividend of 1¾ per cent on preferred, payable Nov. 1 to stock of record Oct. 17.

S.A.E. to Consider Bus Development

Philadelphia Meeting to Study All Angles of Coach and Bus Problems

PHILADELPHIA, Oct. 28—Motor-coach operation, standardization and regulation of motor coaches and the handling of freight and store-door deliveries by motor truck will be the chief topics discussed at an automotive transportation meeting of the Society of Automotive Engineers in Philadelphia Nov. 13 and 14, at the Benjamin Franklin Hotel. Attending members will visit the plant of the Philadelphia Rural Transit Co. and a banquet will be held on the first night of the meeting. The sessions will be open to non-members directly interested in the subjects.

State Standardization

R. B. Stoeckel, Connecticut commissioner of motor vehicles, will discuss motor coach standardization and regulation from the viewpoint of state authorities, while H. F. Fritch, of the Boston & Maine Railroad, will explain features of motor coach design and construction that are deemed necessary to successful operation by transportation companies. Gasoline-electric coach operation will be the subject assigned to R. Harlan Norton, president of the Philadelphia Rural Transit Co., and W. F. Evans, president of the Detroit Motorbus Co., will speak on experience in the operation of six-wheel coaches.

Freight handling by motor trucks in co-operation with railroads, and direct freight deliveries from terminals to consignees' doors will be dealt with by Joseph Scott, of Scott Bros., Philadelphia, F. H. Kulp, of Kulp Transportation Lines, Buffalo, and a representative of a Canadian organization. Dr. E. J. Cattell, of Philadelphia, will be the chief speaker at the banquet, with A. F. Masury, of the International Motor Co., as toastmaster. B. B. Bachman, of the Autocar Co., F. C. Horner, of General Motors Corp., and A. J. Scaife, of the White Motor Co., will be chairmen, respectively, of the sessions on standardization, freight handling and motor coach operation.

Decision on Prices

NEW YORK, Oct. 28—The United States Circuit Court of Appeals, in reversing an order by the Federal Trade Commission, which would have required the American Tobacco Co. to cease certain trade practices, has delivered an opinion of interest to jobbers and their associations generally.

The commission held that the company's practice of refusing to sell to jobbers who resold its products below the prevailing price was unfair. The court held that this practice was not only innocent of unfair methods but actually tended to promote fairness of trade and the suppression of unfairness in competition.

The commission's complaint alleged that the company's combination with associations of wholesalers to maintain prices constituted unfair competition. Judge Henry W. Rogers held that practices could not be regarded as unfair, if the manufacturer declined to sell to the wholesaler "who demoralizes the legitimate market by selling at a price which those in the business regard as insufficient to enable the business to be conducted at a reasonable profit."

Cleveland Gets Airplane Show

CLEVELAND, Oct. 28—Airplanes—more than thirty makes and types—will be offered for sale at Public Hall the week of April 5 during an aircraft exhibition modeled after the city's annual automobile show. Airplane accessories, motors, and all products of the aircraft industry will be exhibited in the first show of its kind ever held here, and the first international show to be held in this country.

Will Display All Types

The International Air Exposition Co. is planning the show in co-operation with the Cleveland Chapter of the National Aeronautical Association. Manufacturers from all parts of the world have been invited. Planes ranging in price from $3,500 to $50,000 of both military and commercial types, will be displayed. Glenn L. Martin, of Cleveland, will show two machines. One, a three-passenger commercial plane, sells for $3,500. The other, his latest type of Martin bomber, is priced at $40,000. It carries three passengers and a pilot.

Other exhibitors of importance, who already have contracted for space, are the International Air Transportation Co., which will show its new express plane to be used in its New York-to-Chicago freight route; and the Curtiss Co., Dayton, Ohio.

N. C. Association Meets

CHARLOTTE, N. C., Oct. 26—Organization of automobile tire, battery dealers' and wholesale and retail gasoline dealers' divisions was perfected at the two-day semi-annual convention of the North Carolina Automotive Service Association, which was held here last week. Keeley A. Grice, of Charlotte, president of the State association, presided at the general conference's sessions.

Victor Shaw, of Charlotte, was elected chairman of the tire dealers' division of the State association. W. L. Pope, of Statesville, was elected chairman of the battery dealers' division. A. O. Costner, of Lincolnton, was named chairman of the wholesale gasoline dealers' division, and the retail gasoline dealers elected J. Caldwell McDonald, of Charlotte, as chairman.

Spaces Allotted for National Car Shows

M. & A. M. A. Working With N. A. C. C. to Promote Trade Attendance

NEW YORK, Oct. 26—Nearly one hundred manufacturers of motors, parts, accessories and service equipment have been assigned space in the National Automobile Shows of 1926 in the first allotment just made by the Motor and Accessory Manufacturers' Association.

Exhibiting members of the M. & A. M. A. represent virtually all products of the industry, except completed vehicles. Some of the exhibitors are numbered among the largest companies of the industry and several have shown in every one of the national expositions held since the first shows were staged in New York and Chicago in 1900.

The M. & A. M. A. co-operates with the National Automobile Chamber of Commerce which conducts the show on behalf of its car manufacturing members. The association promotes the show to its members, assigns the spaces and during the latter part of the year works with the N. A. C. C. in promoting trade attendance.

Additional allotments to M. & A. M. A. members will be made between now and show time. The first allotment includes companies the majority of which are exhibiting in both shows, some in New York only and a small number in Chicago only.

Thomas F. Manville Dies

NEW YORK, Oct. 24—Thomas Franklin Manville, chairman of the board of directors of Johns-Manville, Inc., died here on Monday, Oct. 19. Mr. Manville was one of the country's great business builders. For the last twenty-five years, he has been the directing head of Johns-Manville, Inc., the world's largest producers and manufacturers of asbestos, during which time he has built up an outstanding organization fully capable of carrying on his plans and policies to even greater achievements. His brother, H. E. Manville, who succeeded to the presidency of Johns-Manville, Inc., in 1924, was closely identified with him during this entire period and will continue to direct the policies of the organization.

In addition to occupying the position of chairman of the board of directors of Johns-Manville, Inc., the late Mr. Manville was president of the Arizona Asbestos Co., treasurer and director of the Asbestos Wood & Shingle Co., president and director of the Canadian Johns-Manville Co., director of the Fibre Corp., director of the Fifth Avenue Bank, trustee of the Franklin Savings Bank, president of the board of trustees of the Fifth Avenue Hospital and president and director of the Manville Securities Co. He was a member of the Bankers, Metropolitan, and Union League Clubs here.

American Welding Society Meets

More Than $1,000,000 Will be Spent in Research Next Year—Addresses Made

BOSTON, Oct. 23—More than $1,000,000 will be expended next year in welding research, according to a statement made by Prof. Adams, of the Massachusetts Institute of Technology and founder of the American Welding Society, at the Fall meeting of that body, which closed here today. The technical, research and business sessions which opened Oct. 21, were all held in the buildings of M. I. T. Twenty-four manufacturers exhibited products and equipment which were demonstrated to the public during the three-day meeting.

In a paper by H. M. Hobart and W. Spraragen, it was urged that manufacturers who contemplate the use of arc welding, design their structure or parts so as to conform to the technique of arc welding, in order to ensure adequate strength of the completed part and a minimum cost of production. In determining cost figures it is believed that pounds of metal deposited per hour is a better basis of comparison than linear feet per minute.

Favor Flame Test

C. A. McCune,, director of research of the American Chain Co., in outlining the importance of welding wire as a factor in obtaining uniformly satisfactory results, suggested the addition of several items to the present specifications of the Society. He favored the flame test for determining the quality of gas welding wire and arc welding electrodes.

H. M. Carter, of the Oxweld Acetylene Co., also advocated adoption of the flame test. J. R. Dawson, of the Union Carbide and Carbon Research Laboratories, read a paper devoted to "High Strength Welds."

J. W. Meadowcroft, supervisor of welding of the Edward G. Budd Mfg. Co., said electric resistance or spot welding has replaced riveting in the fabrication of all steel automobile bodies, and by this and other fusion processes, metal sheets are permanently joined, with joints so smooth that filling in of low spots is entirely eliminated.

Plans Air Passenger and Freight Service

MIAMI, FLA., Oct. 27—The Flores Passenger Aviation Service Co. has been incorporated here with $1,000,000 capital, and will establish a daily airplane service between Tampa, Miami, Jacksonville, Key West, West Palm Beach, and other Florida cities, and Nassau and Havana, Cuba. Twenty-five machines of the German Junker and Italian Caproni type will be used. The company also will conduct a freight service between New York, Baltimore, Philadelphia, Pittsburgh and Miami daily, thence to Key West and Havana.

Officers named include F. Anania, president and general manager, and H. H. Cyrus, secretary.

Percy E. Chamberlain
Appointed Director of Sales, Nordyke & Marmon Co.

Marmon Improves De Luxe Sedans

INDIANAPOLIS, Oct. 28—Many refinements and structural improvements have been added to the Marmon line of five and seven-passenger de luxe sedans, according to an announcement just made by the Nordyke & Marmon Co.

The bodies are of aluminum with sturdy frame work and the cowl is reinforced to give added strength. To give the cars a lower appearance, the tops slope off slightly and the moldings and belt lines are raised at the back.

In the five-pasenger sedan de luxe, the rear windows have rounded upper corners which harmonize with the body lines. The upholstery in both the five and seven-passenger de luxe sedans is Laidlaw de luxe cloth. Both front and rear seats have been given more rake to increase comfort. In upholstering the cushions, six-inch pleats are used and to give a form-fit effect to the cushions, a row of buttons is placed in the pleats about six inches from the top of the seat back cushions; another row about five inches from the front of the seat cushions and a third row at the forward side of the seat cushions.

The auxiliary seats in the seven-passenger type face forward. The three-line design in the hardware and vanity cases is carried out as in the former de luxe models and inlaid mahogany panels are placed under the trim sticks of each door.

Cleveland, Chandler Have Financing Plan

System in Effect is Similar to One Established by Dodge Bros.

CLEVELAND, Oct. 28—A new plan for financing time sales of Cleveland and Chandler automobiles was announced here by officials of the two companies. The new plan, sponsored by the Commercial Investment Trust Co., of New York, is similar in many respects to the plan recently established by Dodge Bros., with the aid of the same financial institution.

Briefly, the new policy provides for the purchaser paying eight per cent interest on deferred payments plus 80 per cent of the local fire and theft insurance rates to cover 90 per cent of the retail sales price. Twelve months are allowed for payments.

Heretofore the Cleveland Company's plan has been to allow a lump sum for interest and insurance over a period of one year while payments were being made. A plan almost identical to this had been in operation by the Chandler Company. Sid Black, vice-president and general sales manager at the factory of the Cleveland Company here, and George M. Graham, who holds the same position with the Chandler Company, are enthusiastic concerning the new plan, both expressing the opinion that increased retail sales are certain to follow as a result of its installation. October has been a banner car sales month for both companies. Messrs. Black and Graham announced with the new plan in operation previous sales records are expected to be shattered.

Chevrolet Approaches Its Best Production

FLINT, MICH., Oct. 26—Chevrolet came within 378 pasenger cars and trucks of equaling its highest production month when it turned out 55,865 passenger cars and trucks for September, it was announced at the factory today.

October output is put at 54,500. This may be changed later to a higher figure, according to factory officials to permit taking care of the orders on hand.

Deliveries to dealers last month amounted to 44,500, making the month second to April and May. According to Charles F. Barth, vice-president in charge of production, the condition is an indication of the industry's becoming more stabilized.

To Hold Sales Conference

AURORA, ILL., Oct. 24—The Lyon Metallic Manufacturing Co. plans to hold a sales conference here just previous to the A. E. A. convention in Chicago. All Lyon automotive service engineers and the home office sales force will attend the conference and then go to the convention.

Men of the Industry and What They Are Doing

Zweibel Service Manager

Stanley Zweibel, who has served as the service manager of the Marmon Automobile Co., of New York, has been appointed service manager for the Nordyke & Marmon Co. plant in Indianapolis, it was announced by H. H. Brooks, general director of sales. Mr. Zweibel will assume his new duties in a few days.

The new executive is well known to the automotive trade as a result of many years' connection with Marmon factory and dealer organizations. He was appointed director of the Marmon Educational Department, in charge of the sales school following the war, and was later made director of service for the company, which position he relinquished to become manager of service at the New York Marmon branch.

Prior to this Marmon connection, Mr. Zweibel was engaged in industrial educational work. He established the first apprentice training school in the shops of the Erie Railroad at Scranton, Pa., and later was director of industrial education in the schools of Bethlehem, Pa., and was supervisor of industrial schools in Pennsylvania. His college training was obtained at Lehigh College and Columbia University.

Schwab at Chicago University

Charles M. Schwab, chairman of the board of the Bethlehem Steel Corp., and principal stockholder and member of the board of the Stutz Motor Car Co. of America, Inc., was one of the principal speakers at the conference on education and industry at the University of Chicago this week. Following his address at the university, Mr. Schwab made a tour of inspection of the Stutz Chicago factory branch, under the personal guidance of Floyd D. Cerf, president of the branch. Fredrick E. Moskovics, president of the Stutz Co., also was a visitor at the branch during the week.

C. J. Helm Retires

C. J. Helm, secretary and general manager of The Acme Motor Truck Co., Cadillac, Mich., announces his retirement from those positions, although retaining his directorship on the board. Mr. Helm has been connected with the Acme Co. ever since its inception ten years ago. For the first eight years of his association with it, he acted in the capacity of secretary and sales and advertising manager, and has occupied the position he is now resigning for the last two years. He expects to leave shortly for Florida to spend the winter.

Driemeyer Runs for Council

Edward W. Driemeyer, for a number of years vice-president of the K&D Lamp Co., of Norwood, O., is carrying on an active canvass for the city council of Cincinnati in the city manager charter election in November.

CHRYSLER DISCUSSES COMPANY'S PLANS

NEW YORK, Oct. 27—Returning from Europe, Walter P. Chrysler predicted production and sale of at least 250,000 cars by the Chrysler Corp. next year and the exportation of at least 25,000. He said Chrysler was now making 850 cars daily, of which 60 per cent were fours and 40 per cent sixes and daily output would soon be increased to 1000. Orders were well ahead of output, and the factory is about three months behind on sixes and four weeks behind on fours.

Foreign sales were about 300 per cent ahead of the same period last year and domestic business about 125 per cent ahead. The selling force abroad has been reorganized and Chrysler now has dealers in every important city. He added that the tax on Chrysler cars abroad was lower than on some of the lowest-priced American cars, and that this contributed to Chrysler success in the export field.

Fisher Tells of Body Corp.

Fred J. Fisher, assistant to the president of General Motors Corp., returning from Europe, said that the Fisher Body Corp. was now producing the largest number of bodies in its history, but no decision had been reached relative to an extra dividend. The corporation agreed in October, 1919, that for five years, at least, two-thirds of the net earnings each fiscal year were to be paid in dividends to common stockholders until they receive each fiscal year dividends at the rate of not less than $10 a share annually.

Chamberlain Goes to Marmon

Announcement is made by H. H. Brooks, general sales director of Nordyke & Marmon Co., Indianapolis, that Percy E. Chamberlain has joined the Marmon organization as sales manager.

As a motor car dealer, and later as general manager of the R. R. Hall Cadillac Co., Denver, Mr. Chamberlain gained wide experience in the industry. His work in developing flat rate methods of repair for the higher-priced type of motor cars contributed largely to its present very general adoption by service shops.

Work Says Tires Are Cheap

Even with five price increases since May, tires are selling cheap on the basis of one-dollar rubber, according to Bertram C. Work, president, B. F. Goodrich Co., who has just returned from a two months' European trip.

Serrano Goes to Mexico

Edmund H. Serrano, director of exports for the Moon Motor Car Co., has left on an extended trip through Mexico and Cuba in the interests of Moon and Diana dealers in those countries. Mr. Serrano said that the recent opening of the National Bank of Mexico, which is issuing for the first time in Mexico paper money backed by a gold reserve, had stabilized business and improved to a marked degree the outlook for financing Moon and Diana sales.

In addition, Mexico was spending $40,000,000 for highways within the next few months, there was no scarcity of labor at reasonable wages, and material for the roads was free. A group of Mexican business men visiting the United States recently said that there would be an increase of 100 per cent in the number of automobiles in Mexico in the next twelve months.

Miller Sales Manager

William Berk, president, announces that Henry J. Miller is now sales manager of the American Auto Lamp Co., Inc., New York. Mr. Miller traveled for an oil company as far back as 1912 and was in the wholesale accessory business in New England for five years. After that he traveled the Middle West for Trico Products Co., Buffalo, and about two years ago joined the sales staff of the American Auto Lamp concern, covering the Metropolitan and New England sections.

C. G. Kellogg Appointed

The Equipment Mfg. Co., Cleveland, announces that it has appointed C. G. Kellogg to take charge of the sales and development department of the "Craftool" division. This division was formerly the Craftsman Tool Co., of Conneaut, O., and the Conneaut plant will continue to manufacture the Craftsman continuous rotary millers as before, but under the new style of the "Craftool Division of The Equipment Mfg. Co."

P. W. Hood Recovers

P. W. Hood, vice-president in charge of sales for the Timken-Detroit Axle Co., Detroit, has returned to his desk after a four months' vacation, due to ill health.

Mr. Hood joined the company in 1911 and was made sales manager in 1919. He was appointed vice-president in charge of sales the first part of 1923.

Hertzler Enters Steel Corp.

A. G. Hertzler, well known to the manufacturing trade because of his many years with The Bearings Co. of America, Lancaster, Pa., and more recently with the steel industry in California, has recently become associated with the sales department of The Pacific Sheet Steel Corp., of South San Francisco, Cal.

Coming Events

SHOWS

Oct. 18-31 — Salonica, Greece, First International Sample Fair.

Oct. 29-Nov. 7—London, Annual Truck Show.

Nov. 9-14—Chicago, A. E. A. Show, Coliseum.

Nov. 15-21 — New York, Automobile Salon.

Nov. 16-18—Chicago, Products Show, National Standard Parts Association.

Nov. 16-21—Detroit, First Annual Bus and Coach Show.

Nov. 16-21—Detroit, First National Motor Bus Show.

Nov. 26 - Dec. 6 — Berlin, Germany, Annual Automobile Show in the Kaiserdamm.

Dec. 7-20 — Buenos Aires, 8th Annual Argentine Automobile Show.

Jan. 9-16—New York, N.A.C.C. National Annual Show, Grand Central Palace.

Jan. 16-23—Cincinnati, 16th Annual Auto Show, Cincinnati Automobile Dealers Association. Harry T. Gardner, Manager.

Jan. 18-23—New York, Twelfth National Motorcycle, Bicycle and Accessory Show, New Madison Square Garden.

Jan. 30-Feb. 6 — Chicago N.A.C.C. National Annual Show, Coliseum.

Jan. 30-Feb. 6—Chicago, Automobile Salon, Hotel Drake.

Feb. 15 - 20 — Louisville, Ky., Louisville Automobile Show, Armory, under the auspices of the Louisville Automobile Dealers Association, J. Garland Lea, manager.

CONVENTIONS

Nov. 5—Drake Hotel, Chicago, General Fall Meeting, Automotive Lighting Association.

Nov. 9-10—Chicago, Hotel La Salle, National Automobile Chamber of Commerce.

Nov. 9-14—Chicago, Automotive Equipment Association.

Nov. 10-11—Washington, Motor Truck Industries, Inc.

Nov. 16-18—Chicago, National Standard Parts Association.

Nov. 16-21—Detroit, Society of Motor Transportation Engineers.

Nov. 16-21 — Detroit, Michigan Bus Owners Association.

Nov. 16-21 — Detroit, American Association of State Highway Officials.

Nov. 17-18—Chicago, National Association of Finance Companies.

Nov. 17-19—St. Louis, National Tire Dealers Association.

Jan. 21-22—Hotel Statler, Buffalo, N. Y., Winter Sectional Meeting, American Society for Steel Treating.

RACES

Nov. 11—Charlotte, N. C.

Nov. 26—Los Angeles.

S.A.E. MEETINGS

National

Nov. 9-10—Chicago, Hotel La Salle.

Nov. 13-14—Philadelphia, Automotive Transportation meeting.

Nov.—Service Engineering meeting.

Coming Feature Issues of Chilton Class Journal Publications

January 1—Automobile Trade Journal—National Shows Number.

January 7—Motor Age — National Shows Number.

January 14—Motor World Wholesale—New York Show Report.

February 4—Motor Age — Chicago Show Number.

February 4—Motor World Wholesale—Chicago Show Report.

February 18—Automotive Industries—Statistical Issue.

Highway Congress Discusses Problems

International Gathering at Buenos Aires Takes Up Constructive Work

WASHINGTON, Oct. 28—National systems of highways in North and South America are a necessity to the future social and economic relations between them, in the judgment of delegates to the Pan American Congress of Highways, just closed at Buenos Aires, according to a cablegram to the Department of Commerce from Pyke Johnson, executive secretary of the United States delegation. The delegates will return to the United States after visiting Rio de Janeiro and Sao Paulo, arriving in New York November 11.

In the ten days the Congress was in session, Johnson reported, all phases of modern transportation were discussed. The dispatch continued as follows:

"To insure a continued program of highway development, the Congress created a permanent official body, composed of national sections in each country, to deal with technical problems, exchange information and discuss such international questions as uniform traffic rules and license agreements.

"After a spirited debate, Brazil was voted as the place of the next Congress, Cuba being the most prominent competitor. The United States delegation cast a blank ballot."

Cleveland S.A.E. Holds October Meeting

CLEVELAND, Oct. 28—O. E. Hunt, chief engineer of the Chevrolet Motor Co., told members of the S. A. E. Cleveland Section at their October meeting that a 1000-lb. three-pasenger automobile may be the future American small car. In his judgment, the future small car will be a six-cylinder one, if the engineers can not take the vibration out of the four-cylinder car.

Mr. Hunt said there would never be a market in America for the European small, low-priced car, because our people expect better performance than the European cars can give.

A. H. Frauenthal, chief inspector for the Chandler Motor Car Co., agreed with the speaker, and stated that he was looking forward to the time when there would be a tremendous demand for a small car for persons to ride to and from their occupations, and to use for errands that must be performed quickly.

Automotive Trade Flourishes in Wisconsin

MILWAUKEE, Oct. 26—Progress in the automobile industry here and in Wisconsin generally continues to a marked degree, and the motor industry is carrying with it the various manufacturers of accessories, parts and kindred lines, including tires. Milwaukee is one of the large parts-producing and accessory manufacturing cities of the country.

Business report services, which analyze all important business and industrial enterprises, are commenting favorably upon the strength and stability of the automobile industry in the city and State. Production at Nash-Ajax, Kissel, Case and other automobile and parts manufacturers is considerably behind orders and, as is the case with the A. O. Smith Corp., production facilities are being extended to cope with the demand.

Tire production is also lagging behind as a result of steady and consistent orders for large quantities of tires, coming from all parts of the country.

N. Y. State Jobbers Association Plans

"Keep Your Place Busy This Winter" Campaign Begins—Program Details

BINGHAMTON, N. Y., Oct. 29—T. W. Whipple, of Whipple's wholesale automotive equipment house here, announces that the committee appointed by the New York State Jobbers' Association has completed plans for operation of the "Keep Your Place Busy This Winter" campaign. The program has been broadened to include all phases of winter merchandising and to emphasize the slogan, "Give Something for the Car This Christmas," as well as the need of winter repairs and reconditioning and the original idea of early shop work possibilities.

The high points of the campaign will be three meetings, in Albany today, Syracuse Oct. 30, and Buffalo Oct. 31. These meetings will inaugurate the campaign.

The program for these sessions include addresses by Arthur R. Mogge, merchandising director of the Automotive Equipment Association; R. W. Proctor, of Black & Decker Manufacturing Co.; Ray Sherman, editor of "Motor," and George D. Fleming, of Fleming Machine Tool Co.

Phila. Automobile Show

PHILADELPHIA, Oct. 29—The 25th Annual Automobile Show, under the auspices of the Philadelphia Automobile Trade Association, will be held Jan. 16-23, inclusive, at the Commercial Museum, 34th Street below Spruce, it was announced today by W. H. Metcalf, executive secretary of the association.

AUTOMOTIVE INDUSTRIES
VOLUME 53 *Philadelphia, Thursday, November 5, 1925* NUMBER 19

Today's Profits — *Conserve Them!*

Strong Reserves for Future Use Should be Built Up While Earnings Are Running High

Motor industry has had prosperous year and extra dividends are expected, but financial structures should not be weakened to gratify market operators.

By John C. Gourlie

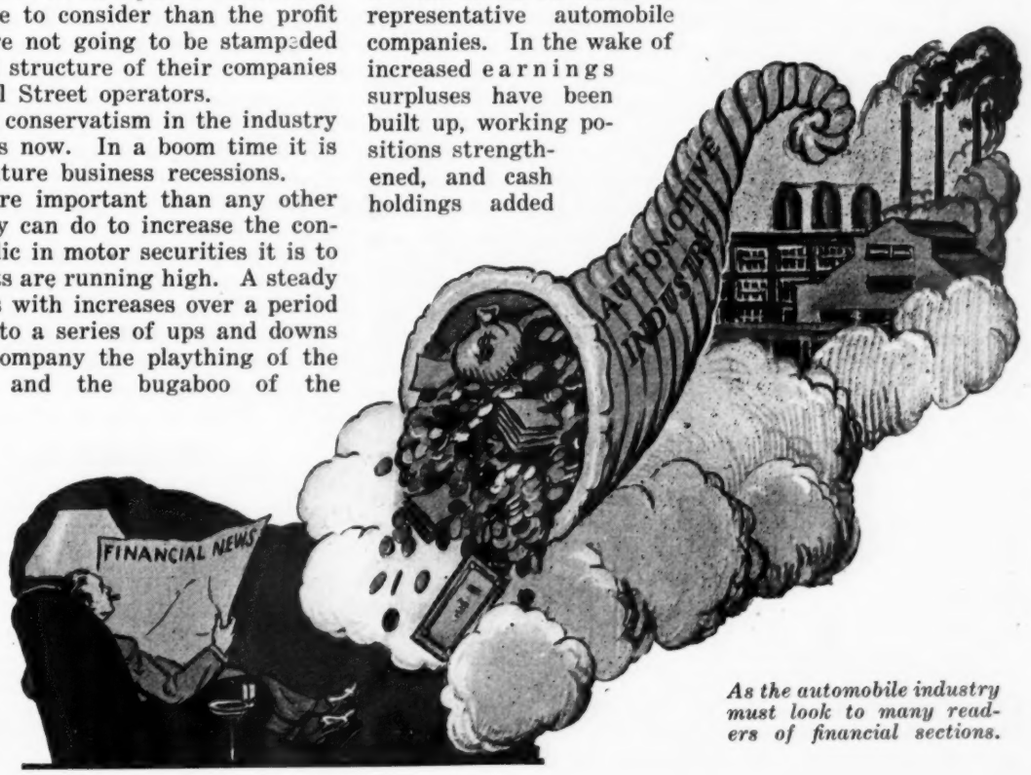
READERS of financial sections and dabblers in the stock markets must by now have formed a mental picture of the automobile industry as holding aloft a magic cornucopia ready to be tilted and to pour a golden stream into the pockets of stockholders. Every renewal of the spectacular advance of the motor shares on the exchanges has been accompanied by roseate predictions of huge melons to be cut, of stock dividends and extra cash dividends.

That there is a measure of truth in many of these reports is obvious. But it is no less patent that automobile executives have more to consider than the profit of the moment, and they are not going to be stampeded into weakening the financial structure of their companies to satisfy the hopes of Wall Street operators.

The need for caution and conservatism in the industry was never greater than it is now. In a boom time it is necessary to prepare for future business recessions.

If there is one thing more important than any other that the automobile industry can do to increase the confidence of the investing public in motor securities it is to build up reserves when profits are running high. A steady record of dividend payments with increases over a period of years is to be preferred to a series of ups and downs that make the stock of a company the plaything of the professional manipulators and the bugaboo of the average investor. There is evidence that the leaders of the industry are working on this principle. They are looking ahead to the time when automotive production and sales will have ceased to expand faster than the increase in population. Until that time arrives there will be periods of meteoric upward flights in earnings such as have been seen this year. Meanwhile conservative financial policies will inspire public faith and establish long lists of stockholders such as are towers of strength for U. S. Steel and other corporations of like calibre. A few companies of this description are already to be found in the automobile industry, but there is room for more.

Some of the figures on which the expectations of the stock speculators have been built are given in the accompanying table. These show great gains during the first half of 1925 in the resources of representative automobile companies. In the wake of increased earnings surpluses have been built up, working positions strengthened, and cash holdings added



As the automobile industry must look to many readers of financial sections.

Improved Financial Position of Some Leading Car Makers

BALANCE SHEET

General Motors Corporation	June 30, 1925	Dec. 31, 1924
Cash	$119,140,468	$88,059,016
*Working capital	188,614,557	161,105,281
Surplus	108,889,720	82,110,929

Hudson Motor Car Company	May 30, 1925	Nov. 30, 1924
Cash	$6,992,791	$6,876,721
*Working capital	20,852,722	15,051,236
Surplus	18,016,309	10,201,419

Studebaker Corporation	June 30, 1925	June 30, 1924
Cash	$12,849,480	$8,025,312
*Working capital	42,288,454	34,194,917
Surplus	31,028,539	23,295,003

Willys-Overland Company	June 30, 1925	June 30, 1924
Cash	$14,869,125	$2,723,922
*Working capital	37,010,571	30,767,622
Surplus	24,349,691	16,437,659

*Surplus of current assets over current liabilities.

NET INCOME

After depreciation, interest, taxes and other deductions

	6 Months Ended June 30, 1925	6 Months Ended June 30, 1924
	$46,082,236	$27,066,989
Per share common stock	$8.19	$1.13

	9 Months Ended Aug. 31, 1925	9 Months Ended Aug. 31, 1924
	$16,722,269	$6,317,469
Per share capital stock	$12.67	$4.79

	6 Months Ended June 30, 1925	6 Months Ended June 30, 1924
	$10,122,048	$7,572,269
Per share common stock	$5.24	$3.88

	6 Months Ended June 30, 1925	6 Months Ended June 30, 1924
	$9,148,634	$2,781,692
Per share common stock	$3.69	$0.88

to. Most of the companies this year will earn at least double all current dividend needs.

Detailed analysis of the figures is hardly necessary. It is plain that in many cases the earnings are sufficient to cover the extra dividends expected in financial quarters. And, with prudence, some of the increased income can be distributed to stockholders. But—

A little study of some earlier financial statements points an illuminating lesson. In the general slump that came to the industry in 1921, after the boom year 1920, the financial position of leading companies was dealt a heavy blow. In some instances, surpluses were cut more than in half. The companies that weathered the 1921 storm were those who used the prosperity of the preceding year to consolidate their positions. On the other page of the record are the companies that were forced to go under.

No Cause for Worry About 1926

Now only the most unreasonable of pessimists would predict for 1926 a repetition of the experiences of 1921. With European conditions on the mend, foreign trade expanding, and tax reduction on the horizon, a very fair prospect is opened up. Only a reversal of present trends could result in a bad year for industry generally and for automobiles particularly.

The slump may be postponed, but of course, it will come, sooner or later. And the next important recession in automobile activity may be even worse in its effects than any of the preceding. The industry has to face the possible consequences of the expansion of time sales buying on liberal terms. This situation is viewed with the utmost gravity by such bankers as Francis H. Sisson of the Guaranty Trust Co. and by such industrial commentators as the editor of the *Annalist*. Buying on time as an institution is condemned by Mr. Sisson almost without reservation, while the editor goes so far as to say that the automobile industry is operating entirely on credit.

This is only true in a sense, to be sure. The manufacturers are paid in full for their cars in most instances as soon as they are delivered to distributors and dealers. There is trend toward the thought that the manufacturer should assume some of the burden of carrying stocks for the dealers during the winter slack period, but this has not gone very far. What is significant is that the cars sold this year will not be fully paid for next year. In the event of an industrial slump, it is a foregone conclusion that repossessions would show an immense increase, flooding the used car market, making new cars more difficult to sell, and adding immeasurably to the problems of dealers and manufacturers in a trying time.

The automobile industry has reached its present commanding position largely through the help of time sales. Money has thus been diverted to motor cars that otherwise would have found other uses, probably not so beneficial to the spender. As long as the deferred payment transactions are handled on a sound basis, there is no reason why automobile manufacturers should not continue to gather the golden eggs.

But the overhanging menace of the unpaid for vehicles, new and used, is just another reason why companies ought to err on the side of conservatism, if that is possible.

The occasional disposition now being shown by bankers, Mr. Sisson included, to attach automobile time sales, may be a warning of breakers ahead. If the banks of the country, foreseeing a period of credit stress, or disturbed by the looseness with which cerdit on automobile sales was being extended, should ever make a concerted movement toward cutting down the amount of automobile paper they are carrying, serious consequences might follow.

Time sales terms can be held down, or brought back to a safe basis, without serious damage to the total of sales, if the measures are taken by the men who are running the industry and who are able to progress slowly and carefully. But if the banks take the situation in hand, there is likely to be an abrupt curtailment that will affect everyone concerned.

Some of the automobile manufacturers have already taken means to protect their interests, through the establishment of conservative time sales and insurance plans that not only place financing on a sound basis but reduce the cost to the purchaser. This certainly has been one of the most encouraging developments of the year, and there seems little doubt that the movement will gain momentum in the period just ahead. By such means will the weapons of the critics of automobile financing be blunted.

Instalment Buying Has Friends

Time sales buying has some good friends in financial quarters. For instance, Herman Waldeck, vice-president of the Continental and Commercial National Bank, said recently:

"Instalment buying is merely an extension of the use of credit by modern business. Credit is absolutely necessary in the conduct of trade today, and the small weekly payment represents an extension of credit to the man in the street who needs it most in all likelihood. It accelerates turnover and creates new wealth."

Such friends ought to be supported, and a tight rein

on the terms of deferred payment transactions is the means indicated. The finance companies themselves have a splendid opportunity, and for this reason the forthcoming convention of the National Association of Automobile Insurance Companies will be closely watched by all elements of the industry. It appears likely that the companies there will reaffirm, probably with modifications, the positions taken on former occasions.

The trouble in the past has not been with the soundness of the tenets to which the finance companies subscribed, but their failure to live up to them. It may be that they have seen the reaction that is apparently setting in against unrestrained financing terms, with their large ultimate burden on the consumer, and that they are prepared to take some more effective action. Of course there is a serious difficulty to be faced by the finance companies—the competition of hundreds of small local concerns which are offering dealers any sort of terms in order to get the business.

In view of this situation, it is likely that the best results in stabilizing instalment buying, at least for a time, will be due to the efforts of the manufacturers.

Advantages of Standard Plans

The producing companies will gain in many ways from the adoption of standard time sales and insurance plans. Their dealers, for instance, will be better able to carry sufficient stocks to give the maximum of service to purchasers. Although everyone is agreed that dealers should not be overstocked, it is by no means an unhealthy situation for the retailers to build up reserves to a certain point during the off season, and they can do this economically only if financed on a fair basis.

The development of all these plans requires time, however, and meanwhile the time sales situation is critical enough to inspire caution on the part of executives when the matter of declaring and increasing dividends is considered.

The companies that have plant expansion programs under way will naturally have to conserve their profits, which is another factor to which the optimists of Wall Street have not given due thought. Again, in the foreign field, expansion is the order of the day, and if a company is to gain its share of this increased business it must extend its foreign organization, an operation not without its items of expense.

Production Should be Watched

Aside from the question of financial resources, unusual restraint seems required this winter in the matter of production schedules, which are already exceeding sales demand in several important instances. Although it would seem that the record of the year to date had definitely proven the value of basing production on sales, the thought lingers that the companies with a surplus of orders during the busy months lost a certain amount of business to less fortunately placed competitors. But experience has demonstrated that it is better to lose a few orders than to take the risk of overloading dealers with cars they cannot quickly dispose of.

All things considered, the sound manufacturing and distribution policies for the immediate future are:

1. Conservation of resources.
2. No stocking of dealers beyond the safety point.
3. More supervision over the delivered price—which means in most cases the time-sale price.
4. Concentration on development of the distributing end—which will have to bear a heavy burden of competition during the year ahead.

Observance of these policies will serve to add to the confidence already being felt by the public in the great organizations of the motor industry. The rise in stock prices has been as much a reflection of the growth of public confidence as of the better earnings of the year.

S. A. E. Paper Tells of New Airplane Developments

TWO interesting developments are being carried on by the Engineering Division of the U. S. Army Air Service at McCook Field, according to information contained in a paper presented before the Washington Section of the S. A. E. on October 23 by Commander E. E. Wilson, in charge of aircraft engine development in the Bureau of Aeronatics, Navy Department.

One of these is the Almen barrel type engine which utilizes the swash plate principle. The other is the cam engine, in which a cam replaces the conventional crankshaft. This engine incorporates in it an inherent gear reduction of two to one and offers improved possibilities in weight saving.

Just lately, Commander Wilson said, the Navy also has been testing a very interesting new engine known as the Attendu type, manufactured by the Eastern Engineering Co., of Montreal, Can. The experimental model is a two-cylinder, solid injection, auto-ignition, two-stroke cycle aircraft engine designed to develop 125 hp. at 1,800 r.p.m. on a specific weight of 3½ lb. per hp. The experimental model, Commander Wilson said, has definitely demonstrated the feasibility of burning heavy oil at high speeds.

Speaking of fuels, Commander Wilson expressed the opinion that we have apparently gone backward insofar as improvement in this direction is concerned and that, as a result, it is necessary to use dopes or blends in aircraft engines which a year ago could be operated successfully on domestic aviation gasoline.

In his paper Commander Wilson took occasion to review the history of airplane engine design at considerable length and described some of the problems which must be met in the future by aeronautical engineers.

PERMO is the name of a new anti-freeze for use in automobile cooling systems which has been brought out by the Boyce & Veeder Co., of Long Island City, N. Y. One filling of the cooling system with this material is said to protect it against freezing all winter. It does not evaporate even in warm weather, or when the radiator steams. It is stated to be non-corrosive, non-poisonous and non-combustible. Hose connections, nickel and other metal surfaces are not damaged by it, and in addition, it has no harmful effects on nitro-cellulose lacquer. A complete chart showing cooling system capacities of all kinds of cars and trucks has been prepared. This chart shows the required amount of Permo to be used to prevent freezing.

Schneider Cup Race Shows Great Progress Made in Seaplane Design

The British Gloster-Napier seaplane, second-place winner with a speed of 199.169 miles per hour

U. S. gets second leg on trophy when Curtiss racer finishes first at 232.57 m.p.h., against 1923 speed of 177.38 m.p.h.

By Athel F. Denham

ALTHOUGH more than half of the original eight planes assembled at Baltimore for the annual Schneider Cup Race, October 26, were either disabled before the race or were unable to complete the course, this year's events showed that remarkable strides have been made in high speed naval aircraft development.

Three planes finished the race, one American, one British and one Italian. The winner, a Curtiss Army Racer, the identical machine which won the Pulitzer Trophy Race on October 12, at Mitchel Field, L. I., but now equipped with pontoons, was flown by Lieutenant James A. Doolittle, who broke all official speed records for seaplanes.

The mere fact that the speed at which this year's race was flown was fully forty-five miles per hour faster than in 1923, when the last Schneider Cup Race was held, shows the increase in speed made possible by improvements in seaplane design in the last two years. In 1923 Lieutenant Rittenhouse, in England, established a record of 177.38 miles per hour. This year the Curtiss Racer boosted the speed for the 350 kilometer (217 miles) course to 232.573 miles per hour.

In 1924 no Schneider Cup Race was run, as the British challenger which had been built for the race was wrecked during the test flight, and as a result, instead of making a walkaway of the race, America called it off. Speed trials of the American 1924 racers were run off, however, but the speeds attained were about the same as those established in 1923. Thus it can be seen what great development in seaplane speeds has been made in the past twelve months.

The machine to finish in second place was a British Gloster, Napier-engined seaplane, the only one of the three racing planes brought to this country by Great Britain left in condition to compete at the opening of the race. It was flown by Captain Hubert Broad, who averaged 199.169 miles per hour for the race. The fact that this speed was well over twenty miles per hour faster than the 1924 American Schneider Cup machine indicates that Great Britain is at worst only less than twelve months behind the United States in the design of high speed naval planes. Great Britain had brought to this country besides this plane and another one identical to it except for minor details, a Supermarine-Napier monoplane which had just before shipment to the United States established a world's speed record of 226.7 miles per hour. Unfortunately, this plane was wrecked in a trial flight just a few days before the race. The second British Gloster-Napier plane, which was thereupon substituted for the Supermarine, also was wrecked, on the morning of the race, when the struts to the left pontoon snapped while the ship was landing in a fairly heavy sea.

Italian Entry a Flying Boat

Although the Italian entry which took third place made a speed of only 168.444 miles per hour, its performance is more meritorious than the figures would indicate. This machine, in contrast with the other entries, is not a seaplane fitted with pontoons, but is a regular flying boat. It has all the appearances of being an extremely seaworthy craft. Italy had entered two of these planes in the Schneider Cup Race, but carbureter trouble just before the race made it impossible for the second ship to start.

Besides the winning Army-Curtiss racer, two other

Curtiss planes of the same design had been entered by the United States Navy and started in the race. Neither of these planes finished, however; one piloted by Lieutenant Ralph Cuddihy, being forced down on the last lap, with only about ten miles to go. For the six laps which he completed, Lieutenant Cuddihy averaged 220.452 miles per hour. This average would have given him second place in the race if he had finished. Lieutenant Ofstie averaged 217.155 miles per hour for the four laps which he completed and would therefore probably have had third place at the worst.

Results of 1925 Schneider Cup Races

Bay Shore Park, Baltimore, October 26, 1925

Order of Finish	PLANE	PILOT	Speed in Miles-Per-Hour for Lap No.: 1	2	3	4	5	6	7	Average Speed for Course M. P. H.
1	Curtiss-Army....	Lt. J. H. Doolittle .	223.16	233.57	234.33	234.46	233.42	234.51	235.04	232.573
2	Gloster-Napier...	Capt. H. Broad....	194.28	198.64	201.54	201.41	199.78	199.64	199.09	199.169
3	Macchi-Curtiss...	De Briganti.....	166.81	155.79	173.86	173.77	170.06	168.72	171.59	166.444
*	Curtiss-Navy....	Lt Ralph Cuddihy.	211.59	221.13	222.22	223.08	222.57	222.58	*	.....
*	Curtiss-Navy....	Lt. Ralph Ofstie...	207.96	219.25	218.98	223.03	223.04	*	.....	.....

* Forced down with engine trouble

On the day following the race, official speed trials were held at Baltimore, during which Lieutenant Doolittle established an official world's seaplane speed record of 245.713 miles per hour as an average for eight trips over a three-kilometer course, four with the wind and four against the wind.

No changes in design of the planes themselves had been made in the Curtiss Racers since the Pulitzer Trophy Race except for the substitution of pontoons for the landing gear. These planes were described in the October 22 issue of *Automotive Industries*.

Slight Difference in Speed

That excellent progress has been made in the design of pontoons for high speed planes is evidenced by the fact that the speed of the planes equipped with pontoons was only about fifteen miles per hour less than when they were equipped as land planes.

The British Gloster III, a tractor biplane, is evidently a development of the well-known Gloster Bamel which won the aerial Derby in England in 1921-22-23, but greatly refined in design. Although somewhat higher powered than the American planes, the Gloster actually had a smaller wing spread and wing area. Its pontoons also appeared larger in proportion to the length of the fuselage than in the American planes.

Although the British Air Ministry is very secretive about the design of all of its fast planes and high powered engines, a few details of their designs are available. The fuselage is covered with plywood and is fitted with vertical fins above and below. The wing section is an extremely thin one, which made it difficult for the builders to fit wing type radiators on the plane. Special radiators had, however, been developed for the Gloster III just before the race but the designers wisely decided not to rely on them and in preference fitted Lamblin radiators in on the leading edge of the lower wings, sacrificing several miles per hour in speed for the sake of increased reliability of the power plant. A curious feature of the wing design is that while the upper wing is rounded the lower is square at the tips. This has probably been done in order to make the ailerons, which are fitted only to the lower wings, more effective. The lower wings also have a decided dihedral angle to provide greater stability. A single inter-plane strut and orthodox stream-lined wire bracing form the trussing of the wings.

The engine cowling is slightly different from that used in the Supermarine plane in that it is considerably larger in the vees and has smaller bulges over the cylinder banks. The bulge over the center bank has been stream lined into the center support of the upper plane. Tail planes are wire-braced and the rudder is slotted to clear the conical end of the fuselage. The floats are made entirely of metal and have shown that they can withstand considerable rough treatment in the water and on land.

It would have been interesting to compare the performance of the Gloster III with that of the Supermarine seaplane, as both planes were equipped with the same engine. As has been mentioned, the engine on the Super-

Below at right—Curtiss Racer seaplane, winner of the 1925 Schneider Cup contest. Above at the right—The British Supermarine-Napier which was wrecked in a test flight before the race. It was considered the most dangerous of the foreign contestants for the cup and was the holder of the official world's speed record for seaplanes, 226.7 m.p.h. Below at left—The Italian Macchi equipped with a Curtiss D-12 engine

History of Schneider Cup Races

Year	Held at	WINNER					
		Country	Course kms.	Plane	Engine	Pilot	Speed M.P.H.
1913	Monaco...	France...	278	Deperdussin Monoplane	Gnome 159 hp.	Prevost.....	45.75
1914	Monaco...	England..	280	Sopwith Biplane.....	Gnome 100 hp.	C. H. Pixton...	86.8
1915 to 1918	Races not held during war						
1919	Race called off on account of bad weather						
1920	Venice....	Italy.....	375	Savoia Flying Boat.....	.....	Bologna.....	107
1921	Venice....	Italy.....	370	Savoia Flying Boat.....	.....	DeBriganti....	111
1922	Naples....	England..	370	Supermarine.....	Napier "Lion"	H. C. Biard...	145.7
1923	England...	U. S.....	345	Curtiss Biplane.....	Curtiss D-12...	Lt. Rittenhouse	177.3
1924	Race called off. British challenger wrecked in trials						
1925	Baltimore	U. S.....	350	Curtiss Biplane.....	Curtiss V-1400	J. H. Doolittle	232.573

marine had larger bulges than on the Gloster III, but the monoplane design made it possible to stream line the two bulges at the side into the wings and the center bulge into the upper part of the fuselage. The fuselage is built in two sections, the front part being made up of steel tubes and the rear being a wooden monocoque. The pilot's seat in this plane was rather unusually placed in that it was more than half way back of the propellers. While this must have decreased visibility in landing, it makes for safety in case of accident, as the pilot is not in as much danger of having the engine catapulted into him. When the machine was wrecked in a test flight and landed head on into the sea it turned completely over, but Captain Biard, who was piloting at the time, escaped without a scratch and climbed out of the cockpit without any difficulty.

Wings Built in One Piece

Bi-convex in shape, the cantilever wings of the Supermarine which are built in one piece, are of symmetrical design, which is a rather unusual departure. In order to somewhat decrease the landing speed of the ship the trailing edge has been hinged to the main wing section to provide additional lift at low speeds if necessary. The ailerons, which are operated by steel torque tubes and torque arms, operate both in conjunction with this flap and independently. No wires are used in the controls of the Supermarine-Napier, rigid tubular rods carried within the structure being used throughout.

A further radical departure in the design of the Supermarine is its novel undercarriage. No vertical bracing is used, the support of the plane on the floats being effected by the use of only two sets of two steel tubes each, enclosed in a stream-lined aluminum casing and triangulated at each end. Two steel rods between each set of struts provide lateral bracing of the floats, which are of the single step type. Lamblin water radiators are mounted under the wings and an oil cooler is mounted under the center of the fuselage.

Considerably Smaller Engine

Not in a number of years has a flying boat competed in a high speed contest, as such ships inevitably have a higher head resistance than equivalent float-equipped seaplanes. The Italian Macchi flying boat, therefore, could hardly have been expected to attain the speeds of the smaller British and American planes, especially in view of the fact that the Curtiss engine in the Italian plane had from 200 to 300 hp. less power than the engines in the other planes. Moreover, De Briganti, piloting the machine, mistook a light-house two miles off the course for one of the turning pylons, thus adding about 4 miles to each lap.

Although the high engine mount gave the Italian plane a rather unusual appearance, the ship seemed to be constructed from a standpoint of ruggedness and reliability. In contrast with the other planes entered in the race, the Macchi flying boat is of wooden construction throughout. The cantilever wings are tapered toward the tips at an angle of two degrees, the span being 31 ft. 11 in., with a total wing area of 175 sq. ft. The machine has an overall length of 27 ft. 4 in. Tail-planes are of the conventional wire-braced type and are fabric-covered. Small balancing floats are carried near the tips of each wing and the boat itself is of the single-step type. The engine is completely cowled in, the cowling tapering to a conical point at the rear. Water radiators are carried at the side and rear of the engine. Although the ship seemed to be slightly under-powered, the take-off requiring a considerably longer run than the other planes, the ship performed very well in the air and took the turns at the pylons nearly vertically with practically no side-slip.

Of the engines, the Curtiss V-1400, used in the American planes, has already been described in *Automotive Industries* of Oct. 22, 1925, and the Curtiss D-12 used in the Italian plane is also well known. Although little information regarding the Napier "Lion" engine is available, due to the secrecy of the British Air Ministry, a few details can be given. By increasing the crankshaft speed of the engine from 2000 to 2700 r.p.m., lengthening the stroke and increasing the compression ratio, but without increasing the bore, the power of the "Lion" has been raised from 475 hp. to about 700 hp. Instead of being geared to the crankshaft, the propeller shaft is integral with the crankshaft. The vees of the engine have been cleaned up considerably by removing the bulky water pipes, etc., formerly used, permitting the cowling of the engine to be carried considerably further into the vees, reducing head resistance. In both the Gloster and the Supermarine, the exhaust of the center bank was taken care of by carrying short exhaust pipes to the bulge in the cowling over that bank.

Two Legs on Trophy

The United States, by winning the 1923 and 1925 races, now has two legs on the cup and if we should win again next year the trophy will become the permanent possession of the National Aeronautical Association. It is expected, therefore, that next year's event will be a hard contested one, especially as M. Louis Breguet has indicated informally since the race that he hopes to build a racer to represent France in the 1926 Schneider Cup in addition to the English and Italian contestants.

The accompanying tables show the history of the Schneider Cup Races, with the remarkable increases in speeds which have been made from year to year, and an analysis of this year's race with the times of the various planes.

THE cementation of ferrous alloys by ferro-chromium is of interest from the standpoint of protection against corrosion at high temperature, and particularly against the action of nitric acid, but in order to effect this cementation, it is necessary to go beyound a temperature of 2,000 deg. F. which marks the appearance of a brilliant surface layer (probably constituted by chromium carbide); this sonstituent is developed the more rapidly the higher the temperature, the less the steel is carburized and the more the ferro-chromium is refined.

Recent Developments in British Automotive Design — *Part 1*

Four-cylinder engines still predominate. Use of four-wheel brakes, overhead valves, unit power plant and pressure lubrication is increasing.

By M. W. Bourdon

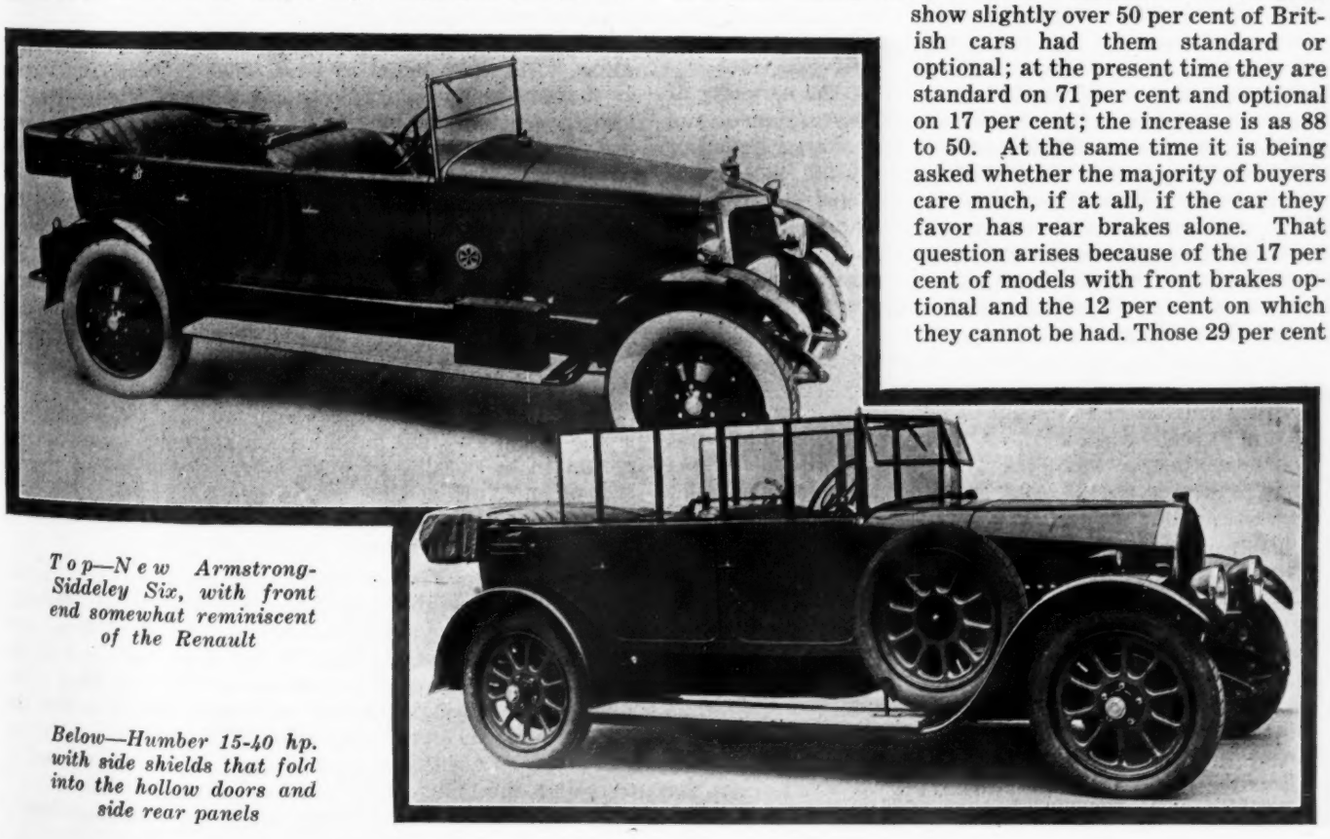
AMPLIFYING the general story of the Olympia, the only important European automobile show to be held this year, which was published in our Oct. 15 issue, Mr. Bourdon has sent us a detailed discussion of the developments and engineering trends evidenced in the cars exhibited. The first part of this story, covering engine and chassis developments, is given here. The second part, dealing with body design, will be published in the next issue.

THE Olympia Show this year indicated clearly that British manufacturers have decided that, while four-cylinder engines are acceptable to the vast majority of buyers when a piston displacement of anything less than 150 cu. in. is in view, the latter capacity represents the maximum unless additional cylinders are afforded. Of 35 new British models appearing at Olympia, not one has a four-cylinder engine above 150 cu. in.; actually there are only six above 120 cu. in.

Another point of note is, that of the nine new sixes there is only one over 250 cu. in.; that one, the 402 cu. in. Bentley, can be reckoned exceptional because of its special character, for it is an exceedingly high-grade, high-efficiency type. For a somewhat similar reason the only six between 200 and 250 cu. in. (the single-sleeve valve Vauxhall) can justifiably be ruled out of consideration when general trends are under review, for it, also, stands in a high price category. Its chassis costs £1050, while that of the new Bentley is £1450.

We come back, therefore, to this: British manufacturers who have introduced new models for 1926 believe that 150 cu. in. is the maximum for four cylinders and that 200 cu. in. represents the maximum current demand for six-cylinder chassis of moderate price.

Four-wheel brakes as standard equipment have greatly increased during the past twelve months. At the 1924 show slightly over 50 per cent of British cars had them standard or optional; at the present time they are standard on 71 per cent and optional on 17 per cent; the increase is as 88 to 50. At the same time it is being asked whether the majority of buyers care much, if at all, if the car they favor has rear brakes alone. That question arises because of the 17 per cent of models with front brakes optional and the 12 per cent on which they cannot be had. Those 29 per cent



Top—New Armstrong-Siddeley Six, with front end somewhat reminiscent of the Renault

Below—Humber 15-40 hp. with side shields that fold into the hollow doors and side rear panels

ALTHOUGH six cylinder cars have become most popular in America, fours are still in larger demand in England and on the Continent. In the table below, which gives the percentage of cars of different types exhibited at Olympia, this difference is quite evident. Actually, the relative demands for fours and sixes in Great Britain are considerably more divergent than this table indicates inasmuch as nearly all of the six cylinder cars shown were high priced jobs such as Rolls-Royce, Lanchester, Vauxhall, Bentley, Sunbeam and several others, while high priced fours of British make are exceptional.

	Percentage of Total			
	British	American	French	Italian
Two-cylinder models	1.04	.....	.....	.....
Four-cylinder	66.66	17.14	77.19	50.00
Six-cylinder	30.20	65.71	19.29	45.00
Eight-cylinder	2.08	17.14	3.51	5.00

represent cars of all sizes and prices—not merely the cheaper or smaller types. Rolls-Royce, for instance, does not offer them as standard on the 20 hp. model (the chassis price of which is still £1100) but as an optional extra at £85; moreover they will not be fitted at all unless they are ordered at the same time the chassis order is placed.

Some makers are being told by their dealers that front brakes are not in demand, for it is safe to say that no manufacturer would refrain from fitting them if orders had been or were likely to be lost because of his cars having rear brakes only. Standardized front axles with Rubury type brakes (as used by the majority of British makers, including Morris) are on offer at low prices; there is, therefore, no technical difficulty in the way. The Essex coach has sold very freely in England of late with rear brakes; so has the 12-25 hp. Humber Four—to quote two entirely different types of cars, the first at £295 and the second at £440 with an open body.

Doubts Value of Four-Wheel Brakes

It would almost appear that some if not the majority of makers are offering front brakes as a sales argument and that where the car appeals on its own merits in other respects their absence is no drawback from the sales standpoint. To be frank, it would seem as though some, if not many, makers have been stampeded by the popular motor press into the adoption of front brakes, feeling more or less compelled to follow the belauded example of others, some of whom, in fact, probably needed a "talking point" for their salesmen.

After being driven for twenty miles in town and country recently by a dealer in one of the best known makes of car in England I asked him if the car had front brakes. He said "I really don't know; it's a car my foreman brought out for me to use today, and I don't know whether it has front brakes or not!" And that, too, after twenty miles driving in traffic and elsewhere.

The troubles, as I see them, in most cases of poor braking efficiency with front brakes, are insufficient leverage with pedal actuation and lack of rigidity in the operating rods, levers, cross-shafts, front springs and, occasionally, the front end of the frame. In depressing the pedal one does not come up against anything "solid," merely against what might be a stiff spring and how much to compress that "spring" before the brakes operate as required is often a matter of doubt.

Rubury type brakes, which have the camshaft below the axle (with one universal joint not precisely under the axis of the steering pivot, so that the inner wheel may be braked slightly more than the outer on a road curve) and ordinary fixed pivot shoes, are the most widely used on British cars, not only in the number of models but in the cars produced, for Morris uses them exclusively. These brakes are efficient enough if properly applied to the chassis and, of course, if correctly adjusted.

Perrot brakes with "floating" shoes are next in favor, appearing on 24 per cent of models as against 36 per cent in the case of Rubury. Only four makes have hydraulic operation, two being of the Lockheed type, the others being the 40 hp. Lanchester,which has an hydraulic servo-assisted arrangement, and the new Vauxhall Six with oil pressure (generated by pedal actuation) in pipe lines displacing rods, etc., without servo. Only Rolls Royce and Sunbeam use a mechanical servo, pedal actuation on the Rolls supplementing the servo at the rear wheels, while full servo operation occurs on the Sunbeam (eight-cylinder model only). Only one British make (Aston-Martin, a high-priced high-efficiency small Four) has front brakes applied alone; in all other cases the four wheels are braked simultaneously, the rear ones usually direct with the front, but in two or three cases by a transmission brake coupled to the front set. Generally, the braking effect and leverage is the same (in theory, if not in practice!) for front and back wheels; but Morris arranges 40 per cent to the front and 60 per cent to the rear by different leverage, while among other exceptions of a similar kind is the new Calcott Six which has 14 in. drums at the rear and 12 in. in front.

Better Brakeshoes Needed

A need of the moment appears to be self-wrapping shoes of simple construction that will operate equally well in both directions. The Perrot floating shoes do not fulfill that requirement, and cases of crumpled rear fenders and panels are reported owing to cars running back on that account. One or two firms are proposing to use the Perrot Bendix three-shoe brake, owing to reports that it is more efficient in preventing or retarding rearward movement than the two-shoe pattern.

Where all brakes apply within the rear wheel drums alone, it is more usual to have what is becoming known as the "six brake system," viz., six pairs of shoes, of which two are located side by side in each rear drum. But there are approximately half a dozen instances of only four sets of shoes; all operated by pedal and the same back ones alone by hand. It is, however, arguable whether the latter arrangement is really legal in England, the law specifying two entirely separate brakes.

All front brakes are internal, except in the two cases where the Lockheed equipment is used (viz., Triumph and a new make, the Monarch). Every conceivable kind of balancing arrangement is in evidence—between front and back sets only, between individual rear and front and back, between each and every wheel and so on. Cable actuation is widely favored, but not always is the cable used for compensation by passing through a transverse sleeve, though it is often so utilized.

Adjustable Brakes on Fiat

The new 7 hp. Fiat at Olympia strikes a new note in this connection; the cable for the rear brakes passes through a short transverse shaft (approximately 14 in. long) and around levers attached thereto, but into each end of the hollow shaft is screwed a sleeve about 1½ in. long. The cable passes through these as well, with the result that the effective length of the transverse section of the cable can be varied, so adjusting the rear brakes. Rods are used to couple up the front brakes, without compensation.

Among British makes there is not the tendency obser-

able in Continental productions to increase the diameter of brake drums. On British cars of 14 hp. the usual diameter is 10 in., though there are exceptions running up to 14, and even 16 in. where there are two sets of relatively narrow shoes side by side in the same rear wheel drum. Aluminum drums with external cooling ribs and lined with steel, apparently in rather wide favor on the Continent, are quite exceptional in British practice.

The tendency to offset the front spring on the axle is becoming more widespread; a pronounced example is the new Calcott Six where the front springs are 35 in. long, but only 15½ in. of that length is in front of the axle center. Rebound plates—one, two and sometimes three—are frequently seen above the main leaves of springs. Gaiters are almost universal equipment, while snubbers (Hartford, Gabriel or hydraulic types) are standard on over 50 per cent of models. Quarter-elliptic front springs are disappearing, owing to the adoption of front brakes, and only two makers of repute (A. C. and Wolseley) are attempting to retain them with a four-wheel braking equipment. Humber and Armstrong Siddeley, on one model each, are among the firms who have dropped quarter-ellipticts. Cantilevers are found on only four out of 35 new models and the trend is entirely toward the half-elliptic.

Dual Carbureters Used

Front axles with front brakes are mostly of "H" section throughout; there are a few examples of "H" section between the springs and round or oval outside, and of tubular axles. The new Vauxhall is tubular and almost straight from end to end, which contrasts markedly with the Rover, the latter being a round section solid forging with exceptional uplift outside the springs.

A notable trend observable in most of the new British sixes and in some of Continental origin is the use of either a dual carbureter or two carbureters; even the new 106 cu. in. Singer Six has two carbureters with separate induction tracts. On the other hand, the new Bentley high-efficiency 402 cu. in. Six has but one carbureter, though satisfactory distribution is claimed by the use of a balancing pipe connecting the second "Y" branches of the inlet manifold.

Overhead valves are increasing but the overhead camshaft is losing ground on a percentage basis. Nevertheless, the L head engine is not discredited by any means, for 10 new models out of 33 (ignoring two new sleeve engines) have side valves. A modified Ricardo type combination chamber design is often adopted.

Pressure Lubrication Increasing

Pressure lubrication is also increasing, even on small engines of under 100 cu. in. This trend accompanies a further increase in engine speeds, for several new models are run up to over 4000 r.p.m., their makers not only claiming maximum road speeds that infer such rates of revolution on all gears but being willing that buyers should run them at those rates. Another allied trend is towards a bigger gear reduction; final drive ratios are often between 5 and 6 to 1. Among the Daimler Sixes, for instance, are 114 cu. in. and 161 cu. in. models with 5.4 to 1 rear axle drives. Two Wolseleys and four Talbots are among others with a ratio of over 5 to 1.

Pressure lubrication for overhead valve rockers is practically universal. A development of note here is that the use of duralumin rockers is commencing, with inserted steel contact pieces. Duralumin connecting rods are becoming quite ordinary and aluminum pistons almost universal.

Magneto ignition is all but universal again; the few makers who adopted the coil system a few years ago have gone back to the magneto in all but one or two instances.

Overhead valves are mostly in line, though the new Singer Six is one example of staggered valves with each pair of rockers on a separate spindle carried by its own pillar screwed into the cylinder head, and a new Lagonda Four has the inlet valves at one side and the exhaust at the other, with two semi-overhead camshafts; in the latter case only the rockers are supported by the head, the camshafts being in troughs integral with the cylinder block.

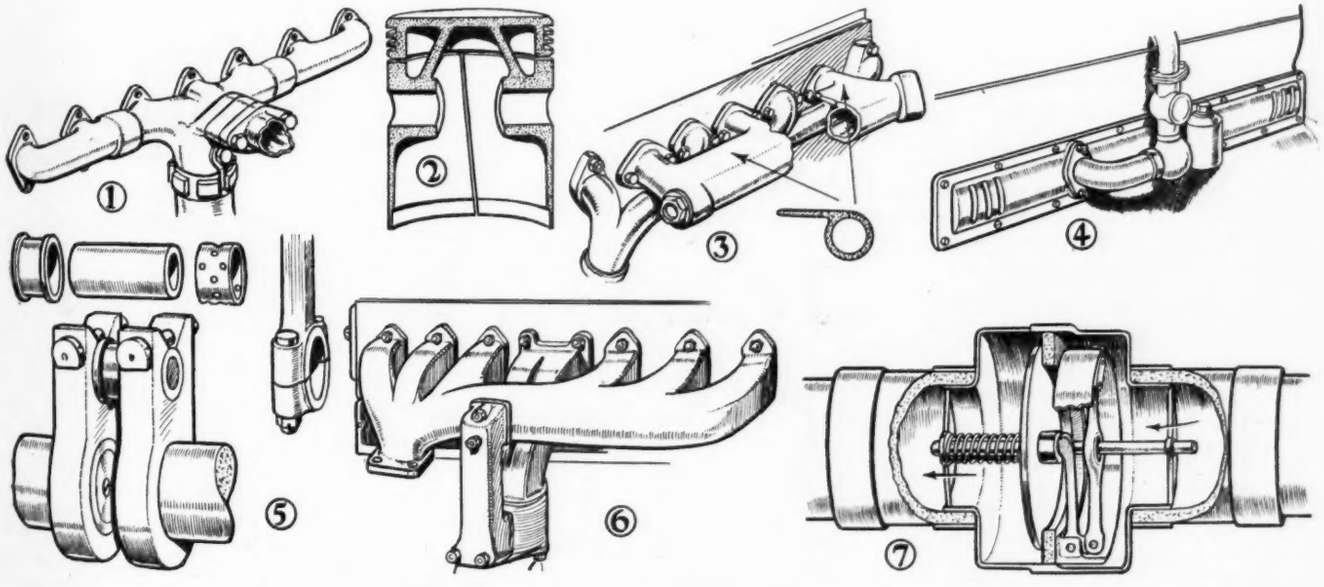


Fig. 1, Exhaust manifold of new Singer Six with central flanges for carbureter and transverse duction passage to far side of cylinder block. Fig. 2, B.H.B. aluminum piston; gas pressure on crown expands the skirt and prevents piston slap. Fig. 3, Inlet manifold with plate extension overlapping exhaust manifold to assist vaporization on new Crossley Six. Fig. 4, Combined air silencer, cleaner and muff at bottom of cylinder block on new Star Six. Fig. 5, Section of Vauxhall Six built-up crankshaft and floating bush and big-end bearings. Fig. 6, Exhaust manifold and inlet pipe of new six-cylinder Armstrong-Siddeley. Dual inlet pipe from dual Claudel carbureter leads to separate transverse passages to front and rear sets of three-cylinders. Fig. 7, Part section of Morris thermostatic valve; flat ring expands to open disk valve through toggles

Several new models have dual-roller chains for the front-end drive, in place of inverted-tooth chains or gears. Armstrong Siddeley on one model has used roller chains for some time past with success, and apparently this has induced other makers to follow suit. There is an increasing tendency to arrange the outlet of the exhaust manifold at the front end, in order to keep the down-take pipe as far away from the body as possible, to prevent overheating the interior of closed cars.

Cone Clutches Still Used

Cone clutches die hard, still being found on 25 per cent of models. The trend of clutch design is to use two driven plates even for cars with engines of under 100 cu. in. While there are several additions to the metal-to-metal plate type running in oil (a new 12-24 hp. Standard is an example with two driven plates).

Unit power plant construction is increasing, though a separate gearset appears on five new models and a unit with torque tube construction on three. Four speeds are increasing and are found on nearly 60 per cent of models as against 50 per cent last year; right-hand controls are coming back, despite the increase of unit power plants, for British buyers do not take kindly to central control—which means left-hand control in England, of course. Spiral bevel final drive would be universal but for the few makers who continue to use worm gearing (Daimler, Lanchester, Standard, Rover and one or two others) even on new models. The hollow-spoked wheel is still most in favor, but wire wheels have gained and now exceed the disk in percentage; the relative percentages are: Hollow steel 59, wire 24, disk 17.

The majority of makers of cars with engines of less than 150 cu. in. are fitting the Dunlop reinforced balloon tires, instead of the "full balloon" standard during the past 12 months; the latter appears to have given trouble, owing to neglect of inflation pressures, which the stouter type is better able to withstand. Four-ply balloon casings are general, for very few British cars of over 15 hp. have other than high pressure tires; only Daimler offers reinforced balloons on all models up to 45 hp.

A marked trend lies toward the wider use of cam steering, which appears to be gaining favor at last, after being found on only isolated cars hitherto; 15 per cent of models now have either the Marles or the Ross, as against 5 per cent last year.

There is a good deal more than usual to record this year in the way of body equipment. Sedan and closed bodies generally are undoubtedly coming to be more in demand, and they form a considerable majority of the output of bodies for cars over 15 hp. Nevertheless they still are in the minority when all sizes of British cars are considered, because the open four-passenger is still standard and most widely in demand for the most popular range of cars, viz., from 10 hp. to 15 hp. Still, there are comparatively few models of any size for which a standard four-passenger sedan is not available; even a new Humber Four, termed 9-20 hp. with an engine of 64 cu. in. displacement and a wheelbase of 102 in. is offered with a four-passenger coach-built sedan, as well as with an open body, the closed car having three doors, positively luxurious upholstery and curved back paneling leading into a semi-dome roof. The price is £315, the open model being £260; it need hardly be said they are unusually high-grade small cars, though front brakes are not fitted.

Weymann Type Not Popular

The true Weymann sedan has not gained in favor; in fact, for small cars (for which it appeared particularly suitable on account of its low weight) it appears to have lost ground. Singers, for example, who make one of the most popular of small cars (80 cu. in. capacity) have dropped the Weymann sedan that was optional last year and are now concentrating upon an almost orthodox construction, though a light framing is used with fabric for the superstructure panels and Weymann type windows, door latches and seats.

Fabric sedans show increase for larger cars, however, though the original Weymann conception is more or less widely departed from in most cases. Apparently buyers do not like the appearance of fabric panels all around, the result being that some makers—Daimler and Wolseley for

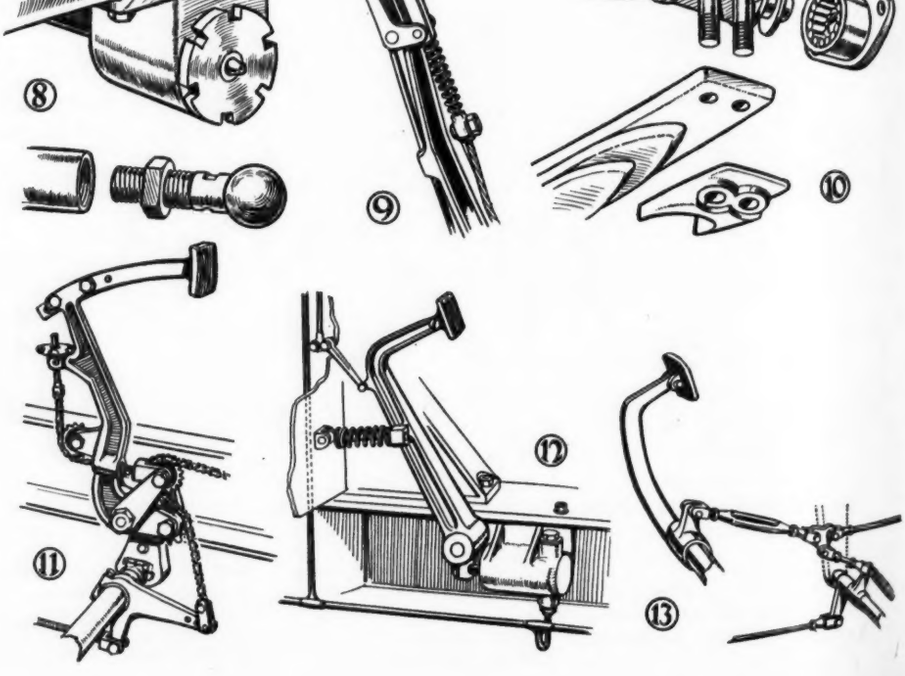
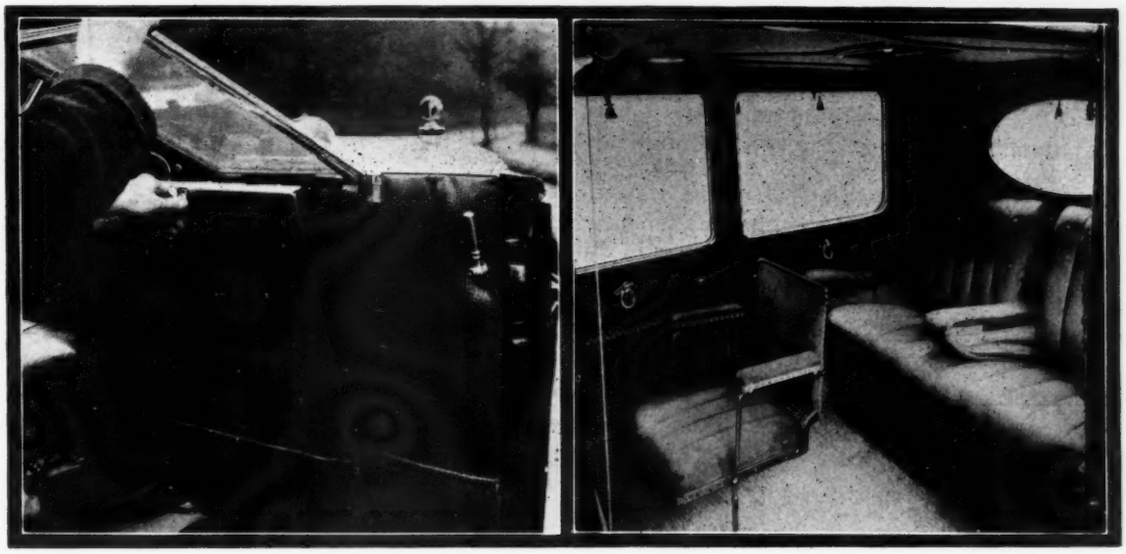


Fig. 8, Spherical bearing at one end of brake cross-shaft on new Vulcan Four. Fig. 9, Hillman hand brake lever with finger and thumb adjustment for cable at top end of hand grip. Fig. 10, Spring end anchorage on new Vauxhall Six with roller bearings in housings attached to frame. Fig. 11, Combined compensation between front and rear brakes and centralized four-brake adjustment on new Lagonda. Fig. 12, Pedal of new Vauxhall Six operating hydraulic brakes; initial movement of pedal closes valve to oil reserve tank by linkage attached to pedal above release spring. Fig. 13, Compensating linkage between front and rear brakes on Lea-Francis



Right — Interior of custom-built limousine with hinged central arm rest fully upholstered underneath and indistinguishable when folded back

Left—Sections of Austin 20 side shield folded and in process of being stowed inside front door

instance—fit aluminum panels up to the belt line on a light but comparatively rigid framing, and fabric above, though Wolseley offers all-fabric panels for a lower price. Rovers use a nearer approximation to the Weymann system and three or four other makers list a fabric sedan that is more or less on Weymann lines; Crossley has a coach with all fabric panels on a light framing without Weymann joints. Custom-body builders show many Weymann type constructions at Olympia and some are difficult to distinguish from orthodox designs so far as outline is concerned.

Four Door Cars Increase

In the case of ordinary sedans, those with no pretense of having light framing, there is a definite trend toward the elimination of aluminum or other rigid and painted panels for the back of the body above the belt line; a fabric-covered framing, with fiber or plywood corners is becoming general on low and medium-priced jobs, while the rigid paneled dome roof seems to be disappearing. Roofs are usually of fabric, well padded with cotton or fibrous wadding on a latticed framing; curved edges and back are usual and consist of plywood or fibre covered with fabric, though some have painted and varnished aluminum running to a line out of sight on the roof, there joining up to the fabric.

Four-door bodies are far more prevalent on British cars than was the case 12 months ago. That applies to both open and closed cars, and to chassis with side as well as those with central controls. Admittedly, the driver's entrance is often seriously restricted by right-hand levers, but that is considered no worse than the inconvenience arising from central levers when the left-hand entrance is used. With the English driving rule "Keep to the left," drivers generally find it more convenient to use the left-hand door, and the majority would rather have a clear entrance on that side, without central levers to obstruct them in getting to their seat on the right of the car, than a clear right-hand entrance.

Doors generally are a good deal wider than hitherto; even on quite small four-passenger four-door bodies they run up to 24 and even 26 in. On larger models 28 and 30 in. doors are found. The underlying cause of that trend is the great increase in separate and adjustable front seats. The latter remove the need for a fixed panel alongside; a well-supported pillar displaces the panel and the width of the latter—it was anything from 8 to 16 in. wide—has been divided between and added to the two doors.

From that trend another has arisen, the hinging of the doors at front and back; that is to say, the front door is hinged to the cowl framing and the rear door to the framing of the rear side panels of the body, thus relieving the central pillar of door weight. True, that means that the rear doors tend to swing open if left unlatched when the car is started; but that disability is counteracted by an advantage worthy of note. Front-hinged rear doors allow a mud-begrimed rear fender to be exposed and soil the clothes of entering passengers, whereas, a rear-hinged rear door forms a shield when opened.

An advantage of front seats with hinged backs is that the full width of the rear doorway can be made available by pushing forward the hinged back of the seat. Even if the seats are occupied, their occupants have only to lean forward slightly to enable the hinged back to be pushed clear of the rear doorway. The wider doors would not be of much use with fixed front seats, unless the latter were located so far forward as to give the average driver too short a leg reach on the popular small car.

There are, however, marked differences in the design and comfort of separate and adjustable front seats, with or without hinged backs. Some of the best examples resemble the Weymann type of seat, which has a thick and pliable cushion and back upholstery, the latter secured to a wooden framing hinged to the base framing, fabric straps limiting the angle of rearward inclination of the back rest. Seats of this kind are used as both full-width and one-passenger units, the latter appearing for the first time in a few Weymann sedans, where, as in the original conception, they are attached to the chassis frame.

IN spite of the fact that the proposed Trans-Sahara motor service had to be abandoned because of the threatening attitude of the natives, Citroen does not seem to have lost hope of eventually establishing such a service, for he is still carrying on exploration work. News from abroad is to the effect that the Citroen Central African Expedition, comprising eight chain track vehicles, is now approaching its final destination. Setting out from Algeria on October 28, 1924, and crossing the Sahara and the Chad territory, the expedition proceeded to Stanleyville in the Belgian Congo. Moving eastward, Lake Albert was reached and crossed; upon disembarking at Butiabwa, the party proceeded towards Victoria Nyanza, arriving on the north shore on April 19. The expedition was here split into four groups, each consisting of two cars. One of these groups has reached Mombassa, another arrived at Dar-es-Salam on May 14, a third group traveled south, along the west coast of Lake Nyasa, and is making for the coast of Mozambique.

REDUCED die costs through recent developments in die-machining methods; reduction of number of body parts which, with modern welding methods, speed assembly operations; more economical production and installation of upholstery, and accelerated finishing processes — these are the reasons why all-steel bodies are now possible for cars produced in moderate quantities. This article describes in detail the latest methods developed for all-steel body construction by the Edw. G. Budd Mfg. Co., of Philadelphia.

All-Steel Bodies Now Possible With Moderate Productions

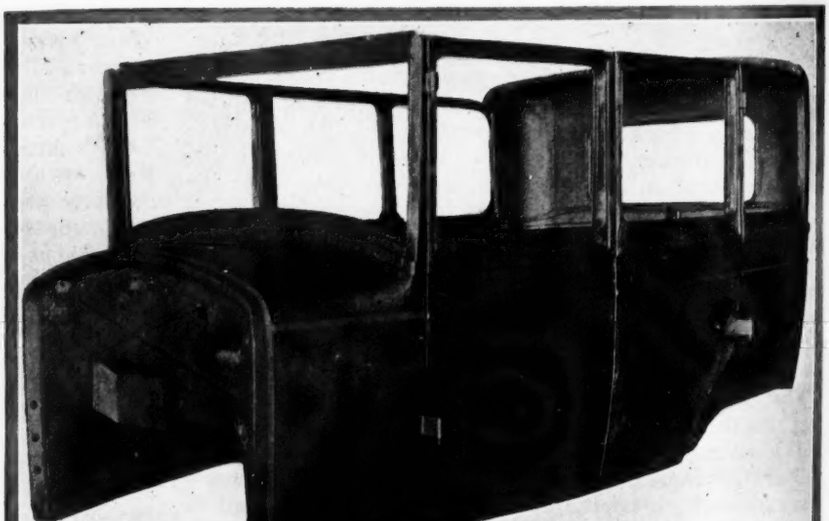
Budd methods for Jordan bodies reduce die costs, decrease number of parts, speed assembly and make economies possible in upholstering and finishing.

By K. W. Stillman

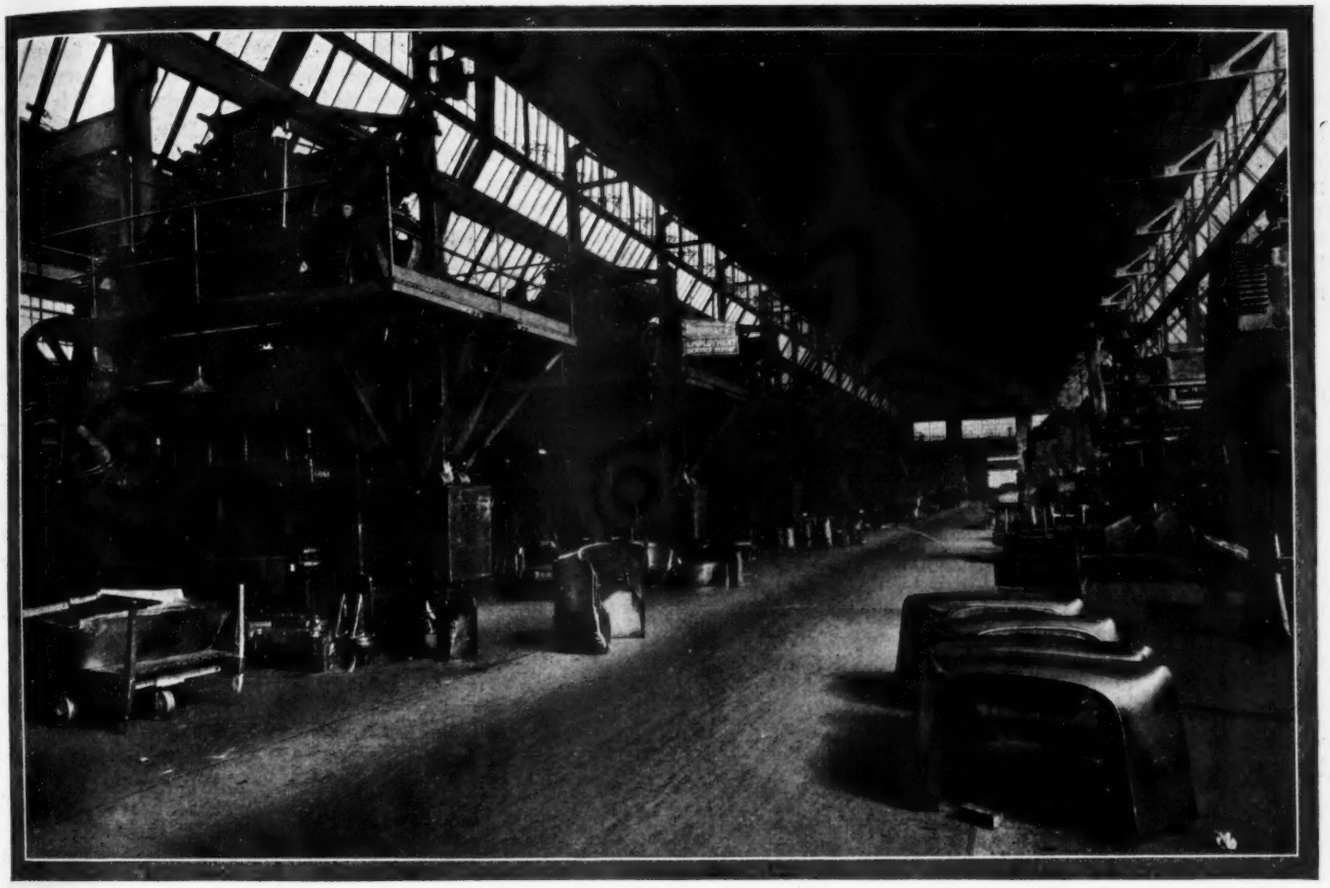
THE prevailing opinion about all-steel bodies has been that although they might be satisfactory from a design and operating standpoint, production and cost considerations limited their use considerably. It has been thought that the great cost of dies and the heavy overhead necessitated by expensive press equipment made the use of all steel bodies possible only on those makes of cars that have very large production.

With these beliefs held generally by the automotive world, the announcement by Jordan that its new series "J" line eights would be equipped with all-steel bodies and that they would be sold for less than any other vertical eight on the market brought many inquiries as to how it could be done.

These Jordan bodies are made in the Philadelphia plant of the Edw. G. Budd Mfg. Co. A study of the production methods in use there and of the product turned out suggests the following reasons why all-steel bodies are possible on medium-priced cars with relatively small production: Die costs are not so great as is generally believed because of recent developments in die



Side and three-quarter front views of Jordan all-steel sedan body after all assembling operations have been completed. Note the narrow body pillars and the symmetry of the body panels



General view of press room where all forming and blanking operations on Jordan all-steel bodies are performed

machining methods; the number of pieces necessary for this type of body is considerably less than for most other types; this makes assembling more simple and the use of electric spot welding reduces the period of the production cycle from presses to shipping room to about 45 minutes; more economical production and installation of upholstery is made possible, and finishing processes are considerably accelerated.

The start of actual mechanical production is the making of die patterns. These are made in the usual way from drawings and dies are cast from them. Incidentally, dies are cast outside the Budd plant and this is the only part of the entire process which cannot be handled right in the plant. The dies are made of cast iron with steel inserts at cutting edges and other points where wear will be great.

The time required to make dies now is about 75 per cent less than it was but a few years ago and this is a very important item in making steel bodies less expensive. This reduction has been made possible by new developments in machining methods.

An idea of the time saved by the present method is given by comparing the work of completing a set of dies for the doors of a four-door car under the two methods. The eight dies would require about eight months' work under the old methods, but now they can be finished in not more than two months.

Several different grades of sheet steel are used in the Jordan sedan, depending upon the service required. For exterior panels a high finish is required which is not necessary for pieces to be concealed by upholstery or other equipment. Sizes of the sheets purchased are determined by the stampings to be made from them so that as little waste as possible will be produced. Each sheet is inspected and marked before it is unloaded from the freight car.

Some of the very large stampings, such as the tonneau back, are not blanked out with dies, but before the sheets go to presses are cut to shape on a circular cutter which operates like a band saw. Other sheets, when necessary, are cut to the proper size on a squaring cutter, the size being determined not only by the actual size of the stamping but also by the depth of the draw with consequent stretching of the metal.

24 Important Pieces

In the Jordan sedan there are just 24 important pieces which make up the frame and the body. These are the tonneau back, which includes the lower and upper panels; right and left rear side panels, which include in a single piece upper and lower panels as well as the wheel housings; four doors, each of which consists of two main stampings; the cowl, or shroud, which is made in three pieces; right and left body sills; right and left front posts; right and left center posts; right and left roof headers; the front seat back, and the dash. Each of these pieces is a sheet metal stamping.

The sheets, which previously have been cut to size, are sent to the pressroom and after passing through there, are ready for assembly. Nearly all of the pieces require several press operations of forming and blanking, but this is compensated for to some extent by equipping some of the presses with more than one die so that several operations are performed at once. The larger presses, of course, are stationary but are arranged so that straight line production is carried out as far as possible. This is further aided by the mobility of many presses used for smaller operations, such as punching holes, which are placed in position between the large

presses so that a single sheet may pass directly through most of the necessary operations, if not all of them, without any trucking whatsoever.

In the assembly work there are four main sub-assemblies which come to the final assembly jig. These are the rear tonneau assembly, consisting of the tonneau back and the two side panels; the shroud and front post assembly, consisting of the three shroud pieces, the two front posts and the upper and lower windshield braces; and the assembly of the body sills, center posts and roof headers.

Jigs Used in Assembly

In all the assembly work jigs are used so that the assembled pieces must agree in shape and size with the desired standard. In assembling the rear tonneau, the tonneau back and the two rear side panels are placed in the jig which is clamped down, holding the pieces rigidly in the proper position. The top and bottom of the two joints are gas welded together and the three pieces are further fastened together by a series of electric spot welds made at intervals along the seam. The operator, with a light movable electrode, then can fasten the pieces together as rapidly as he can move his electrode from one hole to another.

The assembly is removed from this jig and placed in a holder by which it is brought to a spot welding machine where the seam is permanently fastened by a continuous line of electric spot welds.

After the welding has been completed, the assembly is turned over to a gang of finishers who file and polish the welds, straighten out any uneven spots and put it in condition for the final assembly. The welds are not conspicuous on the outer surface since the company has developed a method whereby the low spots in the metal usually resulting from spot welds have been practically eliminated. After the finishers are through it is absolutely impossible to tell where the weld is and from the outside the assembly looks like a single piece of sheet steel.

In the finishing operations abrasive wheels and many odd shaped files are used and there is also an electric hammer used to eliminate any wrinkles in the metal which may have resulted from the pressing operations.

The same general methods are used for the other assemblies as for the one just described. The individual pieces are rigidly clamped in a steel jig, the outer edges of the seams are gas welded, they are further tacked together by spot welds and then they are permanently fastened by a continuous line of spot welds and straightened and polished.

Some idea of the speed with which these operations are performed may be gained from the statement that 15 minutes is a liberal allowance for completing the rear tonneau assembly, including straightening and polishing. This is the most complicated sub-assembly, so that, inasmuch as each assembly is made by a different group, it may be said that 15 minutes after the press work is completed a body can be ready for the final assembling work.

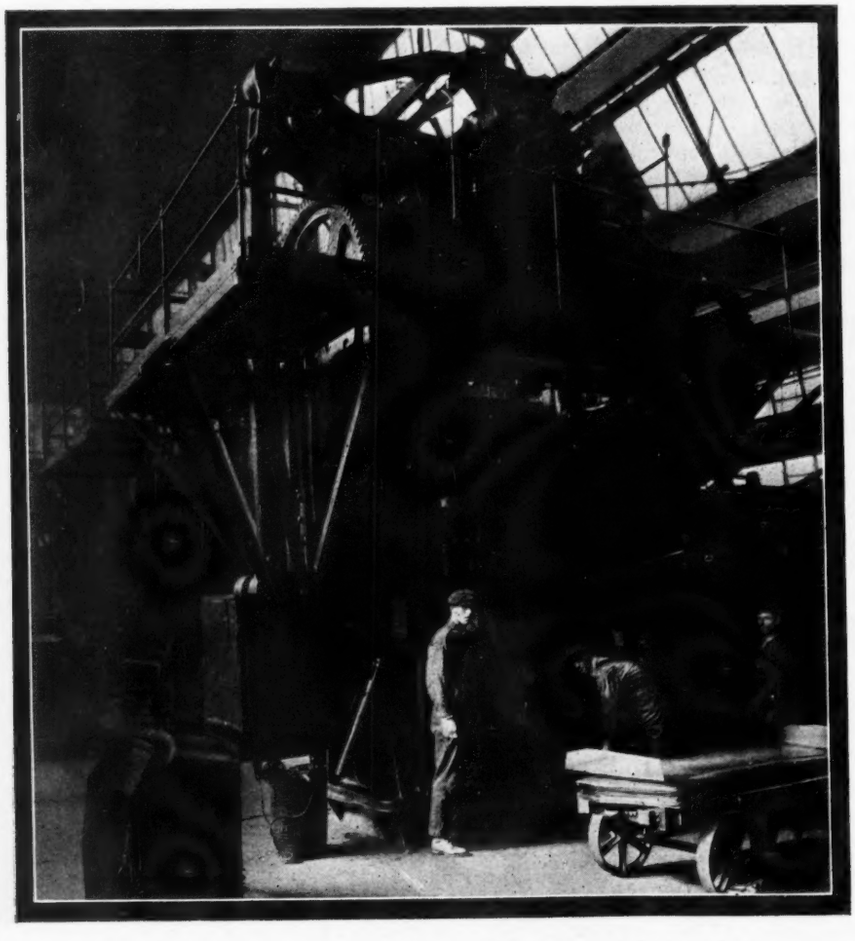
Welds and Rivets Used

The final assembly is carried out in the same manner as the sub-assemblies. A jig assures that each part is right in size and shape. Gas welds, spot welds and a few rivets are used in fastening the parts together. Besides assembling the main sub-assemblies of tonneau back, cowl and the two side frames, several other pieces, such as three bottom cross members, are installed in the body while it is in the final assembly jig. From the time the first piece is placed in this jig until the assembled body is handed over to the inspector something less than 10 minutes elapse.

From the final assembly jig the body goes to the slow-moving conveyor. The first operation here is trying the body with a roof template to see if the contours are right for making the roof fit properly. The doors are hung, floor boards installed and a general inspection of clearances, tapped holes and various other items is made. About 15 minutes is required for a body to pass along the conveyor.

After leaving the conveyor the body receives the front seat back and base and a final inspection. This last inspection covers not only the mechanical parts of the construction such as door fit, clearances, etc., but a careful inspection of the entire body surface for detection of low spots or any other breaks in the required contour of the body. About five minutes are required for this work.

From this operation the body goes to the shipping room to be packed with 13 others in a car bound for the Jordan plant in Cleveland, where it is fitted with a roof and upholstery, finished and mounted on a chassis.



One of the giant presses used in making sheet metal stampings

Rigid inspection is maintained throughout the entire production cycle. Whenever a die is placed in a press the first stamping is closely inspected to make sure that it agrees in every detail with the desired result and every half hour thereafter until the run is completed the inspector makes another examination of the work being turned out.

In the assembly rooms each sub-assembly is inspected for loose joints, unevenness, low spots, roughness and any other factor which may make an unsatisfactory product. After the final assembly each body undergoes another inspection for the same items and before it can be shipped, must be passed by a Jordan inspector stationed at the Budd plant.

A summary can now be made of some of the more important points of this type of body construction. The first thing noticed is the decrease in the number of parts used. For example, the rear side panels, which are stamped from a single sheet, include the wheelhousing, the lower panel, the upper panel and the window frame. The tonneau back includes in one piece upper and lower panels and the window frame. The necessity for a body pillar behind the rear door is eliminated by the construction of the rear panel and the addition of a short strengthening piece which is fitted in one of the assembling operations. All beadings and moldings are formed in the panels themselves. Vertical members are small, giving maximum vision.

Further advantages are found when the body is finished and upholstered. Incorporated in the body structure are openings and lugs by means of which seat backs and cushions and other trim can be snapped into place in a manner similar to the fastening of a glove. This permits seats and other upholstery work to be built in independent units as a production proposition instead of requiring hand fitting to each body.

In finishing the body considerable economies are possible because of the smooth finish of the steel, making glazing, rubbing by hand or filler coats unnecessary. The entire body can be placed in ovens after enamel or lacquer is applied and heated to as high a degree of temperature as is desired.

Can Business Prevent Unemployment?

INDUSTRY bears the cost of unemployment, whether it will or no. That's a fact that isn't always realized by industrial managers, because so much of the discussion about unemployment in the past has been from the sociological or the humanistic angle. But those business men who have taken the time and the trouble to study carefully the unemployment problem have realized long ago that capitalism inevitably must bear the ultimate cost of those fluctuations in labor demand and utilization for which it is responsible.

As a matter of fact, a good many industrial managers have recognized this fact in an indefinite sort of way for a good many years. But it's a far cry from a mental conception of such an idea to a practical interest in solution of the problem presented. The tendency is for individual managers to lay the blame of unemployment on business cycles or some other abstract entity and to visualize their own activities as necessarily a bit of flotsam to be tossed about on the waves of depression and prosperity.

The little 216 page book, "Can Business Prevent Unemployment?" just published by Alfred A. Knopf, New York, sturdily combats this fatalistic philosophy and puts the issue squarely up to individual managers, although it recognizes clearly and discusses fully the strong effects of market conditions and business cycles on the particular plant. It points out that seasonal unemployment can be minimized through efforts along three main channels:

1. By concentrating on the distributive side of the business.

2. By introducing supplementary lines for manufacture during slack periods.

3. By manufacturing for stock during slack seasons.

Two business men and two college professors have collaborated in the writing of the book. The hand of the professors has been heavier in its preparation than that of the business men, but the result of the cooperative effort has been to turn out the clearest, most concise and most practical presentation of unemployment problems for the average business executive that has ever come to our attention.

The authors are Sam A. Lewisohn, vice-president and treasurer, Miami Copper Co.; Ernest G. Draper, assistant to the president, The Hills Brothers Co.; John R. Commons, department of economics, University of Wisconsin, and Don D. Lescohier, Department of Economics, University of Wisconsin. They have based their discussion on the thesis that, as regards unemployment, "there is no conflict between the perfectly normal desire of the business man for profits and productivity on the one hand and his public obligation and human responsibility on the other."

To automotive men, the chapter on "How Some of Us Have Met Unemployment" may well bring fresh stimulation to improve market analysis work, to better merchandising activities, and to increase the scope and usefulness of their business planning department. The general treatment of these factors is well worth the reading of any automotive executive. Some of the specific examples chosen to illustrate the generalities are not quite so apt, however, as they might be.

Quotation from Henry Ford's autobiography, for example, is used to illustrate how the seasonal in production can be eliminated. Says Mr. Ford: "Years ago we began the campaign of education to demonstrate that a Ford was not a summer luxury but a year-round necessity. Coupled with that came education of the dealer into the knowledge that—it would pay him to stock in winter for summer business. . . . Thus we have no seasons at the plant, the production up until the last couple of years has been continuous except for the annual shut-downs for inventory. . . ."

The average executive will miss much which would inform him and little which would interest him if he passes by the chapter on "The Facts of Unemployment," but he is likely to find both to a high degree in the discussion of "Insurance Against Unemployment" which winds up the book. In this chapter is one of the few non-technical, briefly summarized, readable outlines we have ever seen of what has been and is being done throughout the world in unemployment insurance.

The blurb on the cover of this volume claims that "it tells exactly what to do and how to do it—" The text doesn't live up to that promise. But "Can Business Prevent Unemployment" is a lively, interesting, thought-provoking little volume that should provide an interesting two hours for any automotive executive.

Automotive Industries
November 5, 1925

Six Channels of Distribution Open to Bumper Manufacturers

Legitimate jobbers, however, believed to offer best medium as they are in close contact with dealers and accessory men in their territories.

By Arthur J. McElhone

THERE are six possible channels of distribution for bumpers in the automotive field.

Which one of them a bumper manufacturer may select is of interest not only to that particular manufacturer, but to other bumper manufacturers, to car manufacturers, and particularly to car dealers—because, like every other community of human interests, every unit of the automotive industry is more or less affected by the actions of every other unit.

Harmonious cooperation, constructive action, wise selection of sales channels, prices, discounts and orderly policies help everybody. Discord, a foolish reaching after temporary volume of sales, dangerously long discounts, prices based on production costs wrongly arrived at—all these things directly affect the dealer, his reputation and the permanent success of his business. Dealers, jobbers, distributors, jobbers' salesmen, as well as manufacturers of cars and manufacturers of accessories, are all vitally interested in that reputation and that permanent success.

The get-rich-quick methods resorted to by some manufacturers and eagerly accepted by some dealers, come under the head of destructive rather than constructive business. To study the effects of "discount bribing" versus honest, steady service-giving and continously careful and skilful manufacturing methods, is the duty of all concerned with the automotive trade.

The six channels of distribution from the bumper factory are:

1. To jobber—to dealer—to car owner.
2. To car distributor—to car dealer—to car owner.
3. To car dealer—direct.
4. To car manufacturer—to car distributor—to car dealer—to car owner.
5. To car manufacturer—for standard equipment.
6. Bumpers to be manufactured by car manufacturers themselves and distributed through the same channels as their cars.

Suppose we take up these various channels separately and discuss each in its turn.

1. Bumper Factory to Jobber—to Dealer—to Car Owner

This is, of course, the usual, natural channel of distribution, and in ordinary circumstances it is the best. A really good jobber acts as the manufacturer's distributor and the dealer's purchasing agent.

By jobbers, we mean recognized, experienced, well established jobbers, in good standing. The Gyp, "Sad News," mushroom and toadstool variety, unfortunately, are frequently referred to as jobbers, and in one way and another manage to throw considerable mud upon the fair name of jobbers generally. They are the prickly heat, measles and chicken pox of the automotive trade. When we use the word jobbers in this article, we mean healthy jobbers, wholesalers, distributors—not almost-manufacturers, near-dealers or dime-museum auctioneers.

The jobber can do these very definite things for the bumper manufacturer:

a. He can warehouse large quantities at strategic points.
b. Travel salesmen through his territory, keeping in touch with dealers, making it easy for them to buy.
c. Put his own reputation behind the manufacturer's product (a reputation strong locally and one the dealers know they can rely upon for quality, service and quick attention in case of need).
d. Carry the accounts of dealers, releasing the manufacturer from extensive, expensive credit systems and bookkeeping.
e. Buy in volume and pay on the nail.
f. Know his territory and its needs and act accordingly, keeping business in its proper channels and at its normal volume.
g. Publish information concerning manufacturers' goods in a large catalog distributed among dealers.

The jobber can do the following things for the car and accessory dealer:

a. Deliver small quantities on short notice.
b. Give quick service in case of emergency.
c. Extend credit, not only on one particular item but on the full line of accessories, equipment and supplies which a dealer must carry.
d. Advise new and inexperienced dealers as to proper quantities and assortment of stock to carry.
e. Provide a local and convenient source of supply through which the dealer can feel out the value of new products and keep up to date.
f. Furnish a comprehensive catalog from which the dealer may make his selections

with all information before him as to comparative values.

g. Provide experienced salesmen to keep in constant touch with the dealer, bring him news and special merchandising information—salesmen whose business interests are as one with those of the dealer himself.

When a bumper manufacturer decides to deal through the jobber-dealer-car owner channel, the most favored plan now seems to be a careful selection of jobbers, not appointing too many of them, preferably having them evenly distributed throughout the country, and giving them the exclusive sale in their respective territories. And, such decision having been made, to stick very closely to the policy adopted and not have a spotted condition with jobbers in one territory, manufacturers' agents in another, so-called distributors in another, and so forth.

Working Agreements Can be Made

However, where honorable, well balanced, experienced business men are dealing with one another, working agreements allowing necessary freedom of action in unusual cases easily can be made and are made. For instance, in cases where large car distributors or truck fleet owners will not buy from jobbers but insist upon dealing direct with the manufacturer, there is usually an agreement between jobber and manufacturer that where the former cannot sell, the latter is at liberty to deal direct so long as no such price is quoted as will allow the car distributor or truck operator to resell in unfair competition with the jobber.

It is possible that bumper manufacturers will eventually standardize on No. 1 as the best distributing channel. It is the natural one and seems to pay best in normal times. The bumper business has been essentially abnormal in the recent past. Hence the jobber was at a disadvantage, just as were nearly all others concerned with bumper manufacture and distribution.

Some car distributors and factory branch managers have built up quite a bumper business in their own territories. One or two of them are also jobbers, selling to other dealers as well as to their own. But in hardly any case have they obtained 100 per cent even of their own dealers as customers for bumpers. In New England there are local car dealers who buy their bumpers from local jobbers, and bumpers of another make than those handled by the distributor of the car they sell, even though that distributor personally owns part of their own business and offers them a better price. This is because the local jobber sells them all their necessary equipment and supplies, gives them credit and plays the game with them in quick deliveries and helpful service, year in and year out.

Get Exclusive Territory

In cases where car distributors are acting as bumper distributors also, exclusive sale in that territory is generally given them (at least for their own dealers) by the bumper manufacturer. Without this and a very generous discount, the car distributor can hardly do a profitable business in bumpers as his salesmen prefer to spend most of their time on car sales.

Bumper manufacturers who distribute through jobbers increase their sales by special promotion among dealers, by trade and general advertising, but above all by building an excellent bumper, keeping it up-to-date in design and letting the car owner know all about its good points. A bumper which will keep its shape, retain its finish, hold its position on the car and absorb impacts with full protection to the car and its occupants is certainly going to be the winner—if its maker will day in and day out, without let up or side stepping, pound those facts into the consciousness of the car dealer and his customers. And this is the manufacturer's job—not the jobber's.

2. From Bumper Manufacturer to Car Distributor—to Car Dealer—to Car Owner.

This is all right as long as proper prices are quoted and an agreement with jobbers is reached as already mentioned.

In the case of a bumper manufacturer who does not sell through jobbers at all, this No. 2 field is open. But if ruinous prices or discounts are quoted in an attempt to get more than their share of the business, it generally acts as a boomerang in the end. If a public demand be created for some other make and car distributors and dealers swing to the popular will, the bumper manufacturer selling to them direct will be left high and dry, without the jobbers' good will to fall back upon. Because, while the car distributor usually wields considerable influence with his dealers, the jobbers sell them so many necessary things and give them such generous credit and prompt local service and deliveries, that they sometimes buy from him even where a slightly better price is obtainable from the car distributor.

3. From Bumper Manufacturer to Car Manufacturer to Car Distributor.

This has been tried and does not seem to work well. It is getting even further away from the natural channels. Shipments and service are generally delayed to such an extent as to make it extremely unpopular with car dealers and distributors, as well as jobbers.

4. From Bumper Manufacturer to Dealer direct.

This seems to be done by small manufacturers to a limited extent locally where shipping distances are not too great. But over any extended territory it is hardly possible because of high freight rates on small quantities, dependence of dealers on jobbers for other necessary items, impossibility of giving adequate service and lack of a profitable volume of business to be obtained therefrom.

5. From Bumper Manufacturer to Car Manufacturers for equipment purposes.

This is a natural method and does not interfere with No. 1, so long as only a sufficient volume is sold to equip the car manufacturer's output. If a greater volume be sold, at the low price generally allowed for equipment business, then there is danger of job-lot selling to dealers, gyp-jobbers and price-cutters with bad results.

The present trend seems to be away from general equipment of cars at the factory. Only special models are thus equipped with bumpers as well as with windshield wings, spotlights and other accessories. In most car plants the regular output is sent to the dealer without these things and he is largely left free to select them for his customers. The reduced prices of cars, the need for the dealer's making extra profits as well as the fact that tastes differ in various parts of the country as to bumpers, are a few of the reasons for not sending cars through to the dealer already bumper-equipped.

6. Bumpers manufactured by Car Manufacturers for standard equipment on their own cars and for their own dealers to distribute.

This will hardly come to pass. Sufficient volume could not be maintained (except by Ford) to pay for the outlay. Bumpers are specialties and should no more be manufactured by the car builder than should spotlights,

speedometers and shock absorbers. The car manufacturer can, however, build bumper attachments as an integral part of his chassis assembly.

At present most bumper makers are concentrating on the dealer and on the various car distributors as a means of reaching the dealer. The jobber for the time seems to be more or less deserted—by the manufacturers. He is still in touch with the dealers and if he ever decides to specialize on accessories needing installation and service and to travel a special crew of men visiting service stations, then we may see a decided change.

Possibly, in the latter event, the generally adopted plan of distribution in future will be through comparatively few carefully selected and strategically located jobbers, who will have exclusive rights and special contact with service stations and therefore be in a position to meet unusually high quotas. The best jobbers of the country will probably be divided among the best lines of bumpers, the best dealers being divided among those jobbers in the various territories, and a fair field thus attained for all stable brands. The greatest volume of business will then be obtained by the manufacturer who can capture the good will of the most car owners and hold that good will by consistent quality and prompt service.

But, unless the jobbers do recognize the need for special treatment of these accessories which need installation and service, then a new kind of jobber or distributor will come into being—many perhaps from the ranks of car distributors—who can and will give them the attention they deserve.

Both manufacturers and dealers are at present largely overlooking bumper service, which can easily be made a profitable and business-building activity. That bumpers shall be correctly attached to the car is an obvious necessity to permanent success. That car owners shall have a convenient and adequate service station to depend upon in case of accident is also a necessity.

Widespread, dependable service is going to play just as large a part in the survival of the fittest among bumper makers and distributors as it has and does in the manufacture and distribution of other automotive accessories requiring installation and adjustment.

U. S. Auto Club in Paris

THE organization of an American automobile club has been perfected in Paris, the first of its kind in Europe, with a membership consisting of European representatives of the leading automobile companies of the United States. H. H Kelly, formerly assistant to Percy Owens, chief of the Automotive Division of the Commerce Department, and later acting chief of the section, but at present connected with the office of the Commercial Attache in Paris, is the first president of the club. The club will hold monthly meetings and have as guests prominent men of the automotive industry who may come to Paris. Round table discussions will be features of the meetings.

Exports, Imports and Reimports of the Automotive Industry for September of Current Year and Total for Nine Months Ending September, 1925

EXPORTS	Month of September				Nine Months Ended Sept.,			
	1924		1925		1924		1925	
	Number	Value	Number	Value	Number	Value	Number	Value
Automobiles, including chassis (total)	13,979	$10,744,198	22,822	$17,594,722	135,212	$97,731,728	218,471	$162,089,895
Electric trucks and passenger cars	11	16,632	8	5,058	112	143,850	92	144,084
Motor trucks and buses, except electric								
Up to 1 ton	1,630	724,025	.....	.....	15,730	6,482,166	.....	.....
Over 1 and up to 2½ tons	464	650,659	978	1,199,335	4,046	5,454,295	7,144	8,988,634
Over 2½ tons	213	484,670	143	457,721	1,207	2,902,802	1,191	3,611,958
Total motor trucks and buses, except electric	2,307	1,859,354	4,034	2,976,507	20,983	14,839,263	38,346	25,049,327
PASSENGER CARS								
Passenger cars, except electric:								
Value up to $500, inclusive	4,763	1,741,960	7,023	2,615,840	45,371	16,500,491	73,132	26,839,040
Value up to $800	2,907	2,034,095	5,156	3,725,843	32,591	22,030,642	45,242	32,045,237
Value over $800 and up to $2,000	3,734	4,375,828	.....	.....	33,566	36,976,407	.....	.....
Value over $2,000	257	716,329	446	1,203,177	2,589	7,241,075	3,931	10,716,953
Total passenger cars, except electric	11,661	8,868,212	18,780	14,613,157	114,117	82,748,615	180,033	136,896,484
PARTS, ETC.								
Parts, except engines and tires (Lbs.):								
Automobile unit assemblies (Lbs.)	13,096,439	2,511,736	20,935,610	2,909,220	202,345,358	36,339,780	181,893,855	32,172,727
Automobile parts for replacement (Lbs.)	6,153,242	1,537,911	8,424,840	2,349,037	67,527,997	16,827,743	76,508,226	21,060,477
Accessories (Lbs.)	1,640,299	555,912	1,542,707	707,090	14,334,578	5,184,121	14,626,892	6,405,537
Automobile service appliances (n.e.s.) (Lbs.)	582,714	223,346	1,481,172	596,042	4,976,184	1,984,906	9,806,583	3,940,100
Station and warehouse motor truck (No.)	25	6,197	4	8,412	17	74,908	215	162,955
Trailers (No.)	69	16,455	49	12,394	409	146,161	421	195,281
Airplanes (No.)	.....	.....	6	33,500	49	299,677	69	329,876
Parts of airplanes, except engines and tires (Lbs.)	29,249	14,673	8,543	15,104	155,897	156,524	88,031	110,788
BICYCLES, ETC.								
Bicycles and tricycles (No.)	582	14,759	552	14,413	5,125	129,263	5,908	156,130
Motorcycles (No.)	1,002	241,038	1,479	327,913	12,246	2,974,521	16,309	3,684,211
INTERNAL COMBUSTION ENGINES								
Stationary and portable:								
Diesel and Semi-Diesel (No.)	96	17,907	43	92,174	1,343	430,498	705	437,789
Other stationary and portable:								
Not over 10 H.P.	1,993	177,902	2,496	212,075	18,018	1,658,142	21,417	1,851,671
Over 10 H.P.	121	132,036	201	126,649	1,909	1,261,035	2,019	1,707,207
Automobile engines:								
Motor trucks and buses	16	8,348	5,906	522,588	1,005	138,853	37,407	3,182,681
Passenger cars	936	195,747	6,520	879,734	15,876	2,527,336	87,788	9,794,460
Tractors	33	16,762	206	104,548	2,342	716,964	1,153	496,126
Aircraft	12	18,050	21	46,150	133	203,199	53	128,449
Accessories and parts (Lbs.)	511,887	236,366	807,596	357,632	6,281,260	2,760,558	6,860,336	3,140,072
IMPORTS								
Automobiles and chassis (dutiable)	59	110,404	67	89,858	447	649,069	466	804,897
Other vehicles and parts for them (dutiable)	.....	35,670	.....	32,509	.....	815,454	.....	556,864
REIMPORTS								
Automobiles (free from duty)	91	182,208	15	16,318	374	505,152	157	220,661

Motor Buses in California Carried Over 30,000,000 During 1924

Growth of motor bus industry attributed to lack of adequate rail transportation and presence of good roads. Exclusive bus service to 786 towns.

SINCE 1915, when most of the outlying towns of California were served by horse-drawn stage coaches, the motor stage industry has developed with exceptional rapidity. Today there are approximately 1700 motor stages devoted to passenger service and operating in the state and during 1924 over 30,000,000 passengers were carried by them.

This rapid development can be attributed to two reasons, says the Motor Carriers' Association in a recent bulletin: The geography of California, which prevents large sections of the state from having any form of rail transportation, and the ever-increasing mileage of improved roads.

Because of the faster time possible with motor stages and the longer trips that can be made in comfort, the transportation facilities afforded the residents through the motor lines are much more extensive than they ever were under the regime of horse-drawn vehicles. There are now 786 towns in California that are served exclusively by bus lines—they have no other common means of transportation —and there is hardly a crossroad in the entire state that is worthy of the name of a town which is not supplied with bus transportation operating on a regular schedule.

In these localities bus lines are necessities to residents unfortunate enough not to possess private means of conveyance, but as has been true in other sections of the country, motor stages can and do compete with electric and steam rail lines on, possibly, a little better than even basis. In many sections served by railroads the service is infrequent while bus schedules are much more convenient. Usually fares by motor bus are less than by railroad and, with the new modern buses that are being used extensively, personal riding comfort is at least equal to that obtained on trains.

670 Licensed Companies

There are now 670 licensed motor stage operating companies. This number is gradually decreasing because of consolidations and merging of competing lines into larger companies, but extent of service and number of motor vehicles employed is constantly increasing.

The indications are that, rather than injuring steam and electric roads, the development of bus lines has been a distinct advantage to them. No steam line has been forced out of existence through motor bus competition. On the contrary, because buses have opened the country to more extensive settlement and operate as feeders to rail lines, both the freight and passenger traffic of the latter have been considerably increased.

In a number of instances electric lines have substituted motor buses for electric cars and in more cases electric lines are supplementing service by regularly operated bus lines. The cities of Santa Cruz, Pomona and Red Wood are conspicuous examples of the use of buses as adjuncts to the regular city electric rail service.

In Southern California electric railroads have taken up bus service extensively. They operate some 450 buses which carry from 800,000 to 1,000,000 passengers per month. The Key Route System, which operates electric suburban lines across the bay from San Francisco, has supplemented its rail service with extensions of its lines to outlying sections by means of buses. The city of Sacramento is officially investigating the desirability of establishing a series of bus lines to connect its environs with the center of the city.

A Comparison of Taxes

There has always been considerable outcry from railroads and railroad sympathizers to the effect that bus competition is unfair because bus operation brings so much greater return on the investment than is possible with railroads, and also that the latter, because of their extensive property holdings, pay proportionately more taxes than bus operators and receive less since buses operate on the public highways while railroads use private rights of way.

This argument has been presented in California as everywhere else but the Motor Carriers' Association suggests that bus owners, although not having so large investments as railroads, are taxed much more heavily in proportion to their returns. In the last annual report of the State Commission, for the period from July, 1923, to June, 1924, it was shown that the total investment of the stage companies of California was $13,557,976. The total operating revenue was $17,554,981 and total operating expenses were $16,237,160.

California stage lines pay state and local taxes amounting to 5.91 per cent of their gross earnings. Of this amount four per cent goes to the state for highway purposes, half being used for maintenance and repair of the state highway system and the remainder being allocated to the counties for highway work in proportion to the number of motor vehicles registered in each county.

Much has been made of the alleged fact that motor buses are much more detrimental to the roads over which they run than are private motor vehicles, and so should be compelled to pay considerably greater taxes for highway maintenance. It has been demonstrated many times, however, that the wear caused by buses constitutes an almost inconsiderable part of the total wear of highways. The average size, fully-laden bus equipped with pneumatic tires, as nearly all passenger buses are at present, is scarcely more of a factor in road deterioration than the average heavy type limousine. When one considers that there are only 1700 buses operated in California while there are over 1,300,000 motor vehicles it is obvious that the former are not a great factor in road deterioration.

Tests Show Tire Life Lowered by Use of Reclaimed Rubber

Bureau of Standards finds that admixture of 25 per cent in the tread rubber reduces resistance to wear approximately 30 per cent. Four-ply cord tires are used.

IN view of the increasing cost of crude rubber and of the suggestion to use reclaimed rubber in tire construction, some tests on the relative wear of tire treads with varying percentages of reclaimed rubber, made by the Bureau of Standards, are of timely interest.

Road tests were made on eighty 30 by 3½ in. cord tires of standard four-ply construction, made by two manufacturers. The tread of each tire consisted of four sections, each section covering one-fourth of the circumference, so that as the thread wore away the comparative resistance to wear of the four compounds used could be determined with the knowledge that all parts of the tread had been subjected to the same load and road conditions.

Tires made by one of the manufacturers are designated by the numeral 1 and those made by the other manufacturer, by 2, while the four compounds used are designated by letters A, B, C and D. The compositions of the four No. 1 tread sections were as follows:

	Compounds, per cent by weight			
	1A	1B	1C	1D
Smoked sheet	61.1	51.30	45.925	41.175
Hexa*	.4	.45	.450	.450
Sulphur	3.0	3.00	3.000	3.000
Zinc oxide	12.5	11.25	8.625	6.375
Gas black	16.0	16.00	16.000	16.000
Mineral rubber	5.0	5.00	5.000	5.000
Palm oil	2.0	3.00	3.000	3.000
Reclaimed rubber	.0	10.00	18,000	25,000

* Hexamethylene-tetramine.

In the No. 2 compounds reclaimed rubber was used in a similar way, the No. 1B containing no reclaimed rubber; No. 2B, 10 per cent; No. 3B, 20 per cent and No. 4B, 25 per cent.

The test tires were used largely on the cars of rural mail carriers in the District of Columbia, Virginia, Maryland and Delaware, and as most of them traveled over the same roads day after day, it was possible to observe the effect of road surface on tire wear.

In most cases the test was continued until the poorest section had worn practically through the breaker; this generally required about 7,000 miles.

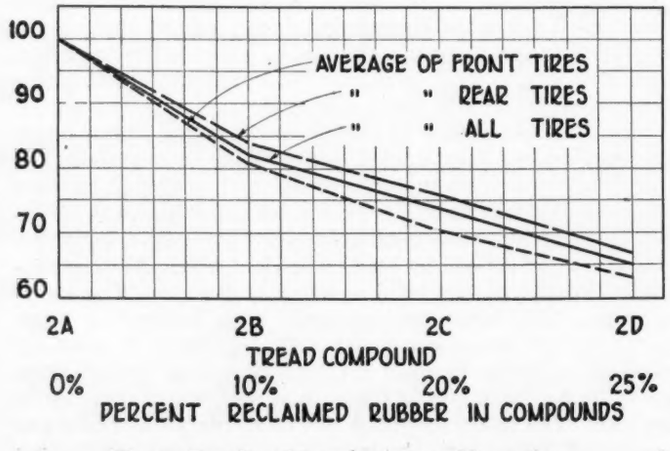


Fig. 2. Results of tread wear on No. 2 tires

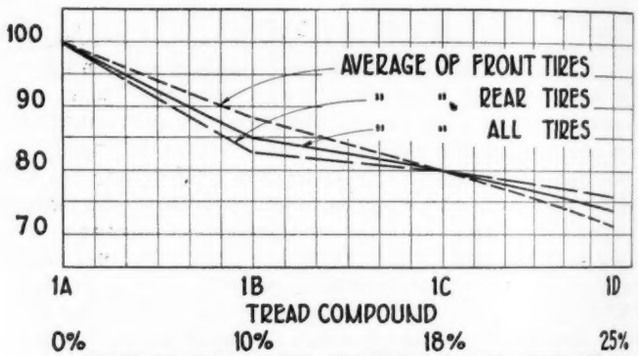


Fig. 1. Results of tread wear on No. 1 tires

When the road test had been completed the tread was stripped from each tire, and a sample 10 inches long was cut from the center of each of the four sections, to be used as a basis for calculating the relative wear.

Three methods of evaluating the wear were considered; of these the one which was found to give most consistent results and which was adopted for the tests was as follows: A central strip, ¾ in. wide, was cut from the 10 in. section, the tread design of both tires being such that this eliminated the non-skid portion and gave a 10 by ¾ in. strip, and the resistance to wear of the different sections was then based on the loss of thickness as determined by measurements of the used and unused treads.

Figuring Resistances to Wear

The relative resistances to wear of the compounds in each tire were calculated from the loss in tread thickness and are based on the assumption that the resistance to wear is inversely proportional to this loss. In each case the resistance to wear of the A compound (without reclaimed rubber) was placed at 100 and the index of the resistances of the other compounds was based on this, a greater index than 100 indicating greater wear and vice versa.

Results from those tires on which it was impossible for any reason to accurately measure the thickness were disregarded in the final averaged results, which are plotted in Figs. 1 and 2 for the two makes of tire respectively.

In order to determine whether the same relative resistance to wear of the various compounds as shown by road

tests could be indicated by laboratory methods, sheets of each compound were made, with a cure equivalent to that of the tire treads. These sheets were tested on six different types of laboratory wear machine.

The machine which gave results closest to those obtained in the road tests worked on the following principle: A complete tire is mounted on a rim, inflated and pressed against the face of a carborundum wheel. The tire and the abrasive wheel are driven in the same direction, but at different speeds. The tire is run until the tread wears through. A wear curve (percentage of reclaimed rubber plotted against relative life) obtained with this machine practically coincided with the wear curve from road tests.

The following conclusions are drawn from the results obtained by the authors of the report, W. L. Holt and P. L. Wormeley, physicists of the Bureau of Standards:

The results of road tests on tire treads containing reclaimed rubber indicate that if reclaimed rubber is used the resistance to wear is lowered roughly in proportion to the quantity used. Even when as much as 25 per cent reclaimed rubber is used a tread can still be made at least 70 per cent as good as one containing new rubber only. Accordingly the advisability of substituting reclaimed rubber for new rubber becomes a matter of the relative cost of the two materials. There are also many products in which the resistance to wear is not of first importance and in which reclaimed rubber may be used as satisfactorily as new rubber.

Although as a matter of common observation the wear on the rear tires is usually greater than on the front tires, the relative wear of the tread compounds is practically the same for either front or rear tires.

The data obtained on the influence of the type of road on wear of tire treads indicate that the same relative differences in tread wear will show up on different types of road.

The laboratory test machines used in these experiments for measuring the resistance to wear of tire tread compounds give results in a large proportion of the tests which are in close agreement with service tests.

A full report of these tests is contained in Technologic Paper 294 of the Bureau of Standards, entitled "Wearing Qualities of Tire Treads as Influenced by Reclaimed Rubber."

A HANDY celluloid slider disk containing information on the composition and heat treatment of S. A. E. and other steels has been issued by the Central Steel Co., of Massillon, Ohio, and should be found useful by metallurgists and others requiring such information. These are two base disks and two rotary disks. As the rotary disk on one side is turned the slot in it uncovers the figures of chemical composition of the steel named on the edge of the base disk, while if the other rotary disk is turned it exposes the details of S. A. E. heat treatments and a list of steels to which they are applicable.

Fume Removal Equipment for Pickling Plants

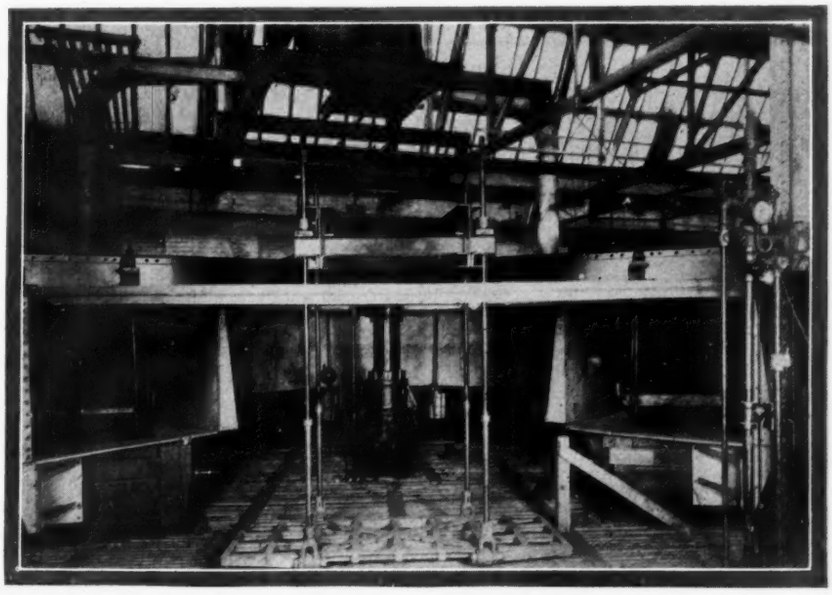
THE removal of acid fumes from plating and pickling rooms often presents considerable difficulty, especially in view of the fact that labor-saving equipment is now essential where large production is required. The fume removal equipment described below is believed to be the first of its kind ever built and it illustrates some of the special problems which are met with in this class of work.

The Northern Blower Co., of Cleveland, which designed, built and installed this equipment, gives the following particulars. It is applied to a Mesta pickling machine. This machine has five arms equally spaced and suspended from a rotatable frame. Each of these arms carries a heavy acid-proof tray, having a loading capacity of six tons, and being suspended by rods so all can be automatically raised and lowered together by means of the steam cylinder shown in the illustration below the center of the rotating frame. In this way, each tray is carried successively from the loading position (in the foreground of the picture) to the various tanks.

All parts of the fume removal equipment are made of special alloy, so as to be acid-proof. All tank-tops are completely housed in a semi-circular nickel-alloy sheet hood, reinforced with nickel-alloy shapes. The ends are left open, to serve as air-inlets to remove the fumes from the pickling room.

When the loaded trays are immersed in the tanks, the semi-circular hood fits down over the tank tops, thus collecting and removing all fumes. When the arms are raised, however, the collars on the suspension-rods engage with the hood and raise it just sufficiently to permit it to revolve with the arms to the next position, where it is again lowered. A closely-fitting deep channel-section flange which runs all around the top of the hood, prevents the escape of fumes during the turning movement.

The piping and fan-details are of the usual type, but are made of acid-resisting material. The piping and fan-case are nickel-alloy throughout, and any tendency for spray or condensed acid to collect in the bottom of the case is avoided by providing a lead drainage pipe at that point, thus returning the liquid to the tanks. Since nickel-alloy was not suitable for the fan-shaft, acid-proof bronze was used for this portion.



Acid-fume removal equipment for Mesta pickling machine installed by the Northern Blower Co., at a motor truck plant

How Bearing Loads on Idler Gears May Be Determined

Formulas given for calculating the bearing load of a three-gear train, for the two conditions where the idler is being drawn in between the other two gears and where it is forced out from them.

By R. S. Condon

IT is important to know the direction as well as the magnitude of the tooth pressures on an idler gear to find its bearing load.

When one gear is driving another we know that the force that each gear exerts upon the other at the pitch point is normal to their respective teeth, but as the friction angle is unknown, we do not know the exact direction of this force at any other point of contact between the gears. It is probably within the limits of practical accuracy for this discussion to assume that the force on the teeth of two mating gears is normal to the gear teeth at all points of contact—as the friction angle reverses on each side of the pitch point—thus the force is assumed to act in the direction of the "line of action," i.e., at an angle equal to the pressure angle of the gears.

The direction of the normal pressures on the teeth of an idler gear from mating gears is contingent upon (1) the pressure angle used, (2) the position of the mating gears about the periphery of the idler, and (3) the direction of the drive (see Fig. 1). If the normal tooth pressures on an idler from two mating gears are opposite in direction the forces will neutralize each other and the resulting bearing load will be zero (see Fig. 1a), but if the two normal tooth pressures on the idler gear are in the same direction the resulting bearing load will equal the sum of the two tooth pressures (see Fig. 1b).

In the accompanying figures only the pitch circles of each gear and only those vectors that represent forces on the idler gear are shown.

The magnitude of the normal tooth pressure on any gear from its mating gear may be found by applying one of the following formulas:

N = normal tooth pressure in pounds.
T = torque in inch-pounds.
r = pitch radius in inches.
β = pressure angle in degrees.
n = number of teeth.

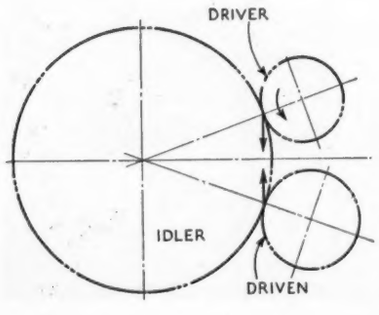


Fig. 1

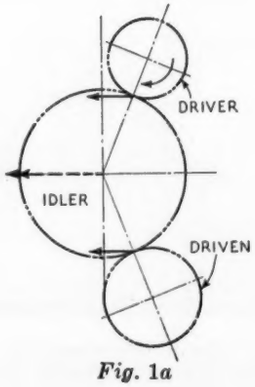


Fig. 1a

p = diametral pitch.
Hp = horse power.
V = velocity in feet per minute at the pitch circle.

$$N = \frac{T}{r \cos \beta} \qquad N = \frac{198000\,Hp}{\pi.p.\ r.p.m.\ \cos \beta}$$

$$N = \frac{33000\,Hp}{V \cos \beta} \qquad N = \frac{396000\,p.\,Hp}{\pi.n.\ r.p.m.\ \cos \beta}$$

When two gears mesh with an idler gear the following algebraic solution for the bearing load of an idler gear is convenient. In making this algebraic solution it is only necesary to know (1) the angle subtended at the center of the idler by lines passing through the two pitch points (see a in Fig. 2), and (2) the condition of the drive, i. e., whether the normal tooth pressures on the idler tend to wedge it in between the two mating gears, or whether the normal tooth pressures tend to push the idler away from the centers of the mating gears. The condition of drive in which the idler is being forced in between two mating gears is often called the "hug in" condition (see Fig. 2a). The reverse of this condition will be designated as the "push out" condition (see Fig. 2b).

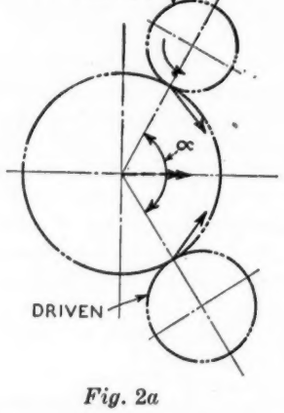


Fig. 2a

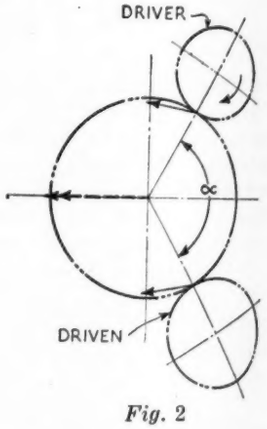


Fig. 2

R = resultant bearing load in pounds.
N = component normal tooth pressure in pounds.
β = pressure angle in degrees.
α = angle subtended at the center of the idler by lines passing through the pitch points in degrees.

The four formulas given below are arranged to give the bearing load directly when N, β, α, and the condition of drive are known. Either of the two formulas listed under each condition of drive may be used to find R, but it will facilitate the calculation to choose that formula in which

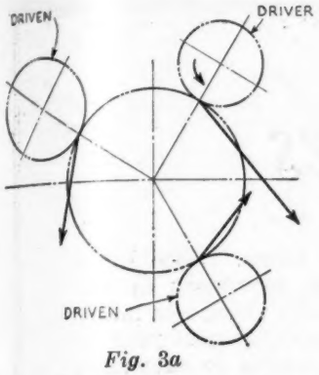


Fig. 3a

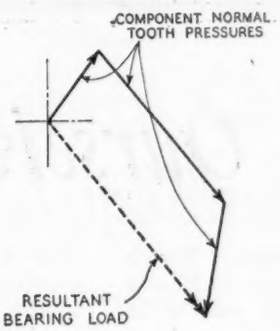


Fig. 3b

the value of the angle in the parentheses is 90 deg. or less.

For "Hug In" condition:

$$R = \sqrt{2}\,N\,\sqrt{1-\cos(\alpha-2\beta)} \quad \text{.....If } (\alpha-2\beta) < 90°$$

or

$$R = \sqrt{2}\,N\,\sqrt{1+\sin(\alpha-2\beta-90°)} \text{ ..If } (\alpha-2\beta) > 90°$$

Note: If the angle $(\alpha-2\beta)$ is negative, use $(2\beta-\alpha)$.

For "Push Out" condition:

$$R = \sqrt{2}\,N\,\sqrt{1-\cos(\alpha 2\beta)} \quad \text{.....If } (\alpha+2\beta) < 90°$$

or

$$R = \sqrt{2}\,N\,\sqrt{1+\sin(\alpha+2\beta-90°)} \text{ ..If } (\alpha+2\beta) > 90°$$

Note: If the angle $(\alpha+2\beta) > 180°$, use $360° - (\alpha+2\beta)$.

The following graphical method of solution for the bearing load of an idler gear is applicable when any number of gears are in mesh with it, but this method is more feasible where an idler gear has more than two gears meshing with it. The bearing load of an idler gear is found graphically by adding the component normal tooth pressures vectorally. This can be done by arranging the vectors that represent the component normal tooth pressures (in magnitude and direction) as side of a polygon—being sure that each vector starts at the arrow end of the preceding vector—and the line that must be drawn to close this polygon will be the vector that represents the resultant bearing load both in magnitude and direction.

The graphical method of solution is illustrated in Fig. 3. The vectors shown in Fig. 3a represent the normal tooth pressures on the idler gear. Each vector is drawn from a pitch point and in the direction of the "line of action" between the gears at that point. The polygon, as completed in Fig. 3b, is made up of the vectors shown in Fig. 3a together with the vector that closes the polygon and that represents the bearing load of the idler gear.

The derivation of the formulas for finding the bearing load of an idler gear algebraically is as follows:

On the "lines of action" produced (see Fig. 4), vectors *OA* and *OB* are drawn representing the normal tooth pressures on the idler gear from gear *A* and gear *B* respectively in both magnitude and direction. It is convenient to add *OA* and *OB* vectorally by reversing *OB* to *OB'* and completing the triangle *OAB'*. *AB'* is a vector that represents the bearing load on the idler gear in both magnitude and direction. Applying the cosine law to find *AB'* we have:

$$AB'^2 = OA^2 + OB^2 - 2OA \times OB'$$

Or, as

$$OA = OB' = N \cos AOB'$$

$$AB' = \sqrt{2}\,N\,\sqrt{1-\cos AOB'}$$

For the "Hug In" condition: $\angle AOB' = (\alpha - 2\beta)$.

For the "Push Out" condition: $\angle AOB' = (\alpha + 2\beta)$.

ONE method of preventing pistons of metal having a high heat expansion, such as aluminum, from giving trouble from seizing consists in turning them to elliptical form, and a patent on this scheme was issued by the U. S. Patent Office some years ago. Recently an English patent has been issued on a somewhat similar method.

According to this, piston bosses are first bored out and an expander is inserted between them by means of which the piston is expanded in the direction of the piston boss axis, in which condition it is finish-turned or finish-ground. The expander consists of a round-head bolt with a round nut, both the bolt head and nut being of such diameter as to snugly fit the bore of the piston bosses and both having a flange at their inner end, these flanges bearing against the inner end of the piston bosses.

ACCORDING to Leon Guillet, a noted French metallurgist, the mechanical properties and the resistivity of commercial aluminum are modified by the rate of cooling, at least if the silicon content is a little high. The tensile strength may increase 40 per cent and the elongation decrease 30 per cent. The electrical resistivity, if the silicon content attains 20 per cent, may be increased by a maximum of 10 per cent.

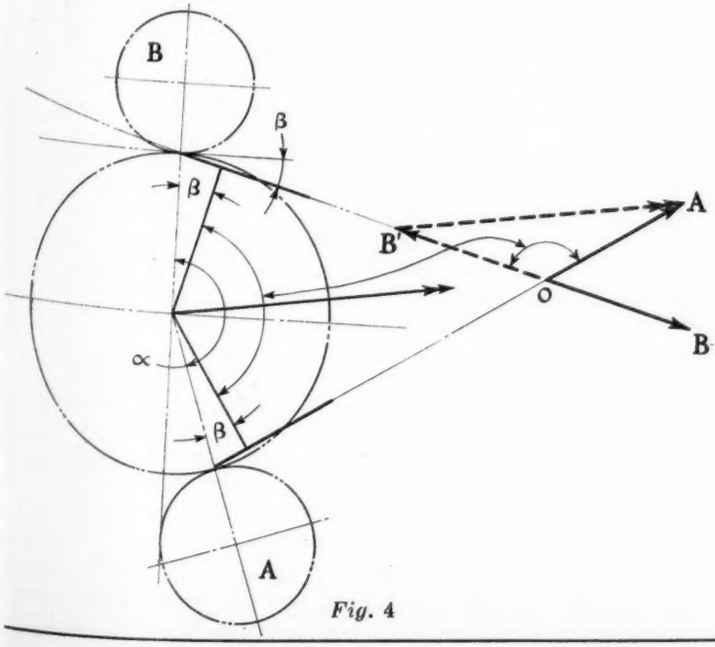


Fig. 4

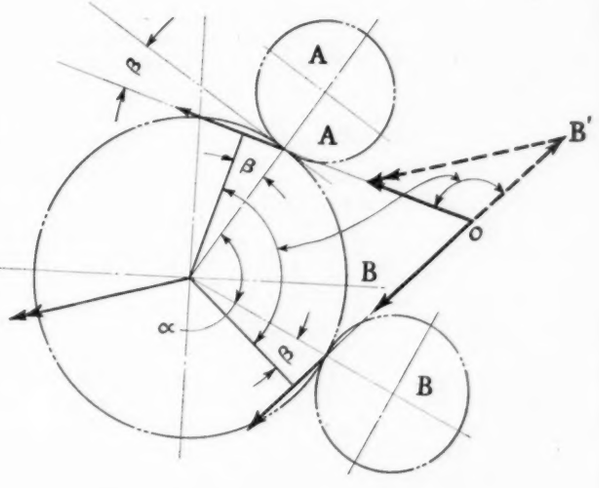


Fig. 4a

Just Among Ourselves

Checking-up-on-Prediction Time is Here

WE'RE getting all ready to take our medicine about the prediction for 1925 production which we made at the beginning of this year. We don't have to say exactly how far wrong we were until the last figures are in three months hence, but it begins to look as though our guess would be off pretty close to 9 per cent. Of course, like all canny writers on business subjects we can point to statements made in connection with our prediction in which we allowed as how 4,000,000 vehicles might be built and we might thus save our reputation as a prophet, but we haven't the conscience to do it. Our real guess was around 3,750,000. In order to make that guess correct, production for October, November and December would have to average only about 194,000 a month as against an average of about 245,000 a month during the last quarter of 1924. There is little reason to think, however, that the last quarter of this year will result in any lower output than the last quarter of 1924. Well, when the time comes we'll be right out in front with the announcement of how far we guessed wrong and hope that all other prophets in the industry will be equally frank. The chief value of predictions often lies in finding out later how far wrong they were so as to get a better basis for future guesses.

Liberal Time Sales Affect Production Curve

SEVERAL interesting points develop from a study of the production figures this year. In casting about to see why we (along with some others) guessed low by nearly 10 per cent, it occurs to us that one reason probably was a lack of full realization of the effects of constantly liberalized time payment terms on 1925 sales. Terms have become increasingly liberal since the first of the year while car prices actually have been lowered materially. This combination of factors has brought into the 1925 market a number of buyers who under other circumstances might not have purchased until later. One might as well recognize the fact that a large proportion of the cars bought this year will not be fully paid for until some time in 1926, while payments on some of them will run on until 1927. This condition has existed, it is true, to a greater or less extent for several years back, but it is a more important factor this year because of the greater liberality of terms.

N. A. C. C. Members Make Especially Good Progress

ANOTHER interesting phase of the 1925 figures is the relatively greater progress made by manufacturers other than Ford. Passenger car production of makers other than Ford for 9 months of 1925 exceeded by nearly 100,000 the output of these same makers for the whole year of 1924. Truck production, Ford excepted, was nearly as great for 9 months this year as for 12 months last. This indicates that the N. A. C. C. group is making relatively more rapid progress than ever before, although Ford's business continues to expand at a good rate.

Banks May Affect 1926 Sales Total

BEFORE anybody begins predicting automotive sales for 1926, it would be a good thing to delve into the probable attitude of the banks toward automotive paper in the next six months. There are some indications that certain interests are beginning to shut down on finance companies as regards paper involving very low down payments and very long terms. Should any considerable movement in this direction take place, less money would be available next year for extending credits to automobile purchasers. The result probably would be to keep actual sales slightly lower than otherwise they might be; to stabilize the business on a thoroughly sound basis; and to stimulate latent sales ability in the dealer field creating the necessity of really merchandising cars rather than of convincing prospects that they can own a car by paying only a very little bit for it. We're inclined to think that if money were not available for such liberal credit extension, the industry wouldn't suffer as much as some people might expect. A little constructive salesmanship can accomplish more in selling cars, we are inclined to believe, than can be offset by the inability to sell for extremely low down payments and on very long terms.

Design Problems Still Numerous in Bus Field

A GOOD many engineering problems are facing the bus engineers today despite the very rapid advances that have been made in bus design during the last few years. The question of wheel and tire sizes is getting special consideration in some cases, because the 20 inch wheels and 32 x 6 tires are said to have failed to give satisfaction in certain instances. Should experience show finally that larger wheels and tires are more desirable, other chassis changes would be necessary. Bus braking equipment is being studied, while special efforts are being made to improve the adaptation of electrical units to bus work. Bus design has progressed to a marked degree in the last five years; that progress is likely to be accelerated in the next five.

Interest as well as effort along these lines is increasing.

N.G.S.

Poorly Designed Carbureters Held Cause of Appalling Fuel Waste

Purdue tests of 23 standard commercial carbureters show only four approximating ideal; others wasteful.

"APPALLING" is the word used by the Purdue University Engineering Experiment Station to describe the fuel waste disclosed by their investigation of the way commercial carbureters meet service demands. Of 23 standard carbureters tested by the Institute only four had operating characteristics which closely approached those of the ideal carbureting device.

The main defects were found to be: Lack of provision for full load enrichment, improper idling provisions, nonuniformity of level-road mixtures and inaccurate metering. The particular type of carbureter seemed to have no effect upon the results obtained since four general types were tested and three of them each furnished one of the good carbureters. Only two makes of the fourth type were tested so the absence of a carbureter which met the requirements should not be taken as evidence that this type is wrong. The conclusion arrived at by the Institute is that nearly all of the 23 devices tested could be made quite satisfactory if more care were taken in their design.

23 Makes Selected

Since the task of testing all sizes and types of carbureters on the market would have been too great, selection was made of 23 makes which are widely used and which represent each fundamental type of design. The final basis of comparison used was the inherent waste of fuel as compared in each case with the ideal engine requirements.

The ideal carbureter, should have the following requirements:

1. It must correctly meter the liquid fuel to the air.
2. It must offer low frictional resistance to the air flow.
3. It must correct the mixture to meet temperature changes.
4. It must provide suitable mixtures for engine acceleration.

A further resolution of the ideal metering requirements is that the carbureter should furnish the automotive engine with:

1. A rich mixture for idling.
2. A lean mixture of nearly constant strength for level-road operation.
3. A rich mixture for full load operation such as for hill climbing.

In addition to their metering qualities the carbureters were tested for pressure loss or resistance to air flow and the effect of changes in air temperature upon the mixture strength.

Four general types of carbureters were tested as follows: Nine plain tube or compensated simple carbureters all of which embodied some form of air choke; eight auxiliary air valve carbureters which have an air valve operating at high air flow rates in an attempt to compensate for the tendency of the simple carbureter to give too rich a mixture under these conditions; two constant vacuum carbureters in which the pressure head on the fuel nozzle is kept at a constant value; and four air-fuel proportioning carbureters which are similar to the auxiliary air valve type but in which the air valve also operates a fuel valve.

Each of these carbureters was tested under conditions which, as the result of further tests were found to closely approximate actual operating conditions, and the results compared with ideal carbureting conditions.

A summary of the data follows:

Metering

1. A carbureter which can be classed as an ideal meter-device would furnish an automotive engine with
   (a) A rich mixture for idling,
   (b) A lean mixture of nearly constant strength for level-road operation.
   (c) A rich mixture for full-load operation, as for climbing hills.
2. Of the twenty-three test carbureters, only four closely approach the above ideal specifications.
3. Several of the test carbureters furnish fairly satisfactory mixtures only for idling and for low-speed, level-road operation.
4. Some of the carbureters furnish satisfactory mixtures for level-road operation at the intermediate speeds.
5. A few of the test carbureters have characteristics which are entirely the reverse of those called for by the ideal specifications.
6. Approximately 40 per cent of the carbureters meter erratically; that is, they do not at all times furnish the same mixture for the same operating conditions.
7. The majority of the carbureters do not adequately enrich the mixture for full-load operation, and as a result they have to be so adjusted that uneconomical operation ensues.
8. With proper care any type of carbureter can be designed to meter the ideal mixtures.
9. Points in the metering of a carbureter causing improper operation depend upon the individual design and may occur at an air-flow rate.
10. The majority of the commercial carbureters tested most closely approach the ideal specifications at car speeds ranging from 20 to 30 miles per hour. Hence, this speed range usually gives the greatest number of miles per gallon of fuel.

Pressure Loss

11. Most carbureters are too constricted, and it appears that 1½-inch and 1¼-inch carbureters are more constricted than are one-inch carbureters.
12. Any type of carbureter, with care, can be designed to offer low resistance to air-flow.

13. Only 26 per cent of the test carbureters allow the engine to develop its maximum power; 30 per cent of the carbureters are so constricted that they carbureter to air temperature changes:

Changes in Air Temperature

14. The following factors influence the reaction of a carbureter to air-temperature changes:
    (a) Carbureter type
    (b) Air bleeding of fuel nozzle
    (c) Design of fuel orifices
    (d) Number of fuel orifices
    (e) Method of throttling fuel orifices
15. Increasing the air temperature usually causes an enrichment of the mixture, the enrichment usually ranging between 5 and 15 per cent per hundred degrees Fahrenheit.

Before being tested the carbureters were adjusted by experts, usually furnished by the manufacturers, so that the results obtained can be assumed to be the best obtainable under average conditions. A full report of the tests is given in Bulletin No. 21 "Commercial Carbureter Characteristics" published by Purdue University.

In the report the carbureters are distinguished by symbols so that individual makes are unknown. There appears to be ample evidence, however, that all carbureter manufacturers can well afford to spend more care on their designs since there are possibilities for improvement even on those particular makes which were close to ideal in performance. Only one of the four offers little opportunity for improvement; the other three have defects which, while not serious, might be remedied without great difficulty to the considerable improvement of their operation.

The remaining 19 carbureters do not approximate ideal metering requirements but it is believed that all of them could be designed to give much better results.

Efficiency of Toothed Gearing

THE strength and efficiency of toothed gearing and their dependence upon such factors as the basic form of the teeth (involute or cycloidal), pressure angle, proportional height of tooth, etc., have for a long time occupied the minds of mechanical engineers, and many theoretical and experimental investigations of these problems have been made and the results published. About ten years ago the Engineering Experiment Station of the University of Illinois became interested and purchased from Wilfred Lewis, who had done very meritorious work along this line, a machine for testing gears. Owing to the intervention of the War the investigation for which this machine was acquired could not be begun until 1922.

The objects were to secure reliable information on the efficiency of spur gearing and data on the change and rate of change of the profiles of spur gear teeth when subjected to wear. In view of the large number of factors which must be taken into consideration, such as speed, load, pitch, gear ratio, tooth form, lubrication and the combination of materials, it was realized that it would take many years to determine experimentally the influence and importance of all of these. Hence, in the investigation the range of variation of each factor was definitely limited.

The results obtained in this investigation up to date are reported in University of Illinois Bulletin No. 47—"An investigation of the Efficiency and Durability of Spur Gears," by C. W. Ham and J. W. Huckert. In addition to an illustrated description of the machine and records of the tests made with it (on unhardened gears), the Bulletin contains a very readable historical review of the principal investigations of the efficiency, durability and strength of toothed gears.

New Way to Adjust Valves

IN overhead valve engines provided with side rods, adjustment of the valve clearance is generally effected by means of set screws at either the valve or the side rod end of the rocker, generally the former. A different method of adjustment has been worked out by Louis Coatalen, engineer of the Sunbeam Motor Car Co., Ltd., and has been made the subject of a patent.

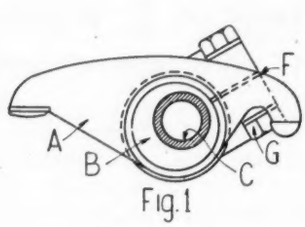


Fig. 1

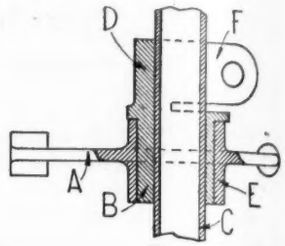


Fig. 2

Sunbeam method of adjusting valve clearance

The rocker is provided with a concentric bushing on its shaft and the clearance is varied by the rotation of the bushing. Referring to the illustration, the rocker *A* is mounted upon the bushing *B* which in turn is carried on the fixed shaft *C*, and the outer periphery is eccentric to the shaft *C*, so that rotation of the bushing raises and lowers the rocker, thereby varying the clearance.

The bushing is extended at *D* beyond the boss *E* of the rocker on one or both sides, and this extension is enlarged in diameter and is split radially at *F*. At each side of the split a lug is formed, and a clamping bolt *G* passes tangentially through the two lugs, the arrangement being such that when the bolt is tightened up the split portion grips tightly onto the shaft *C* and the bushing portion cannot accidentally rotate. To effect an adjustment the clamping bolt *G* is loosened and the eccentric bushing *B* is moved angularly around shaft *C* in the desired direction, after which the clamping bolt is tightened again.

Detail a Key to Success

SUCCESSFUL exporting means an infinite capacity for taking pains. There are few professions or callings that demand a higher degree of regard for minute details than exporting, and the successful exporter is the one who attends most carefully to seemingly "unimportant" details. Those who listen to the complaints of South African manufacturers' agents and importers know that many times "for want of detail an order is lost," says Perry J. Stevenson, writing in a recent issue of *Commerce Reports*, the official publication of the Bureau of Foreign and Domestic Commerce.

Consider, for example, says Mr. Stevenson, the case of a manufacturer new to South Africa who wants some of the automotive accessory business there. He writes to a recommended agent, but tells him nothing as to advertising, commissions, or territory; instead he merely asks, "How much business can you do for me?" That same manufacturer would not waste a 2-cent stamp, much less a stenographer's time, on a letter to an American dealer asking, without giving full details, how many accessories he could sell in a year.

It is unnecessary to elaborate the point. Running through the bulk of the difficulties encountered there is one plain theme—lack of attention to detail. Sound sales policies, excellent dealer cooperation, good advertising, all these are likely to be wasted when some one overlooks or forgets a minor detail.